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CHILD DEVELOPMENT

In this number there are reports of language development and early memories; of children's food preferences and friendships

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CHILD DEVELOPMENT

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The Influence of Age, Sex, and Situation on the Frequency, Form and Function of Questions Asked by Preschool Children

MADORAH E. SMITH

THE purpose of this investigation was to study the influence of various factors on the questions of young children and the development of the interrogative sentence as used by them.

The material analyzed for this purpose consisted of 305 verbatim records of the conversation of 219 children ranging in age from eighteen to seventy-two months old, all from English-speaking homes, three-fourths of whom were in Iowa, 73 in Honolulu, 17 elsewhere. Two situations were studied; situation A when the child was alone with adults and situation C when he was engaged in free play with other children of preschool age. In neither situation was he addressed by the recorder, as his spontaneous conversation was desired. In situation C, 198 records were secured and in situation A, 107. The records of boys and girls were almost equal, 153 being furnished by girls, 152 by boys The average age in each situation was 43.6 months. (In age comparisons by full year two years equals eighteen months to twenty-nine months thirty days; by half-year two years equals twenty-one months to twenty-six months twenty-nine days, two-and-a-half years equals twenty-seven months to thirty-two months twenty-nine days.)

FREQUENCY OF QUESTIONS

Altogether 22,944 sentences were recorded of which 13 percent were questions making a total of 3095 questions asked by the children studied.

Sixteen percent of the sentences in situation A were questions and 12 percent of those in situation C; so that, although there were nearly twice as many records taken in the latter situation, the number of questions in each situation was approximately the same, being 1529 and 1566 respectively. The difference between these two percentages is 3.7 times its standard deviation. Twenty children were observed in both situations, the two records being taken on the same day or within a few days of each other. Fifteen of these children asked more questions in situation A, the average difference in percent of questions being 3.4 percent more in situation A for the 20 cases.

At every age level, whether the records are distributed on the full year or half-year basis, the difference in per-

cent of questions asked to all sentences used is in favor of situation A. Moreover, 22 percent of the records in situation C contained no questions while only 12 percent of those in situation A did not. The difference in this case is 2.4 times its standard deviation which means 992 chances in a thousand that this difference represents a true one.

One reason that more questions were asked in situation A than in situation C may be because young children prefer to ask questions of adults when possible. This is indicated by the fact that 28 percent of the 1032 questions found in the records made in situation C that indicated clearly throughout to whom the child addressed his questions, were directed to an adult present. This tendency was most marked in the case of the youngest children. Every question of the only child under twenty-two months who asked questions in situation C, was directed to one of the teachers in the nursery school. Fifty-six percent of the questions asked by all two-year-olds in situation C, 36 percent of those asked by three-year-olds, 28 percent of those by four-year-olds, 25 percent of those by five-year-olds and 17 percent of those by the older group were directed to an adult in spite of the fact that the child was actively playing in the midst of other children. The youngest children apparently didn't consider it possible that another child could help them out with the desired information, very seldom asking a question of any child. The older children would turn from their play with others to an adult present when bored by their companions: as when Betty aged three, after fruitless attempts at attracting attention by her stunts turns to ask the nurse in charge of her group, "You know our baby?"; or if their interest was aroused by an adult's actions as when Eugene aged four-and-a-half years noticing his parents leaving asks, "Where you all going, mother?"; or to seek permission as, "Could I hang it up?"; or to settle a dispute as when Kathleen aged four-and-a-half asks, "He spells t-e-a-t, teat. Two t's. Is that the way?" and Jackie aged four demands, "Can I use the hammer and not that big fat boy?"; or to seek an answer to a question their companions have failed to answer as when Hester, five-and-a-half years old inquires, "Miss V. where is Miss E.?" or for information that they assume their companions lack as when Eugene turns to the recorder to ask, "What makes ice cream?"

There was a difference of only 1 percent between the percentages of questions asked by boys and girls; the boys asking 1663 questions and the girls 1432. But at two years, the girls asked more questions. The difference is due mainly to the fact that more girls than boys use questions at this early age, the girls beginning to ask questions at an earlier age than do boys; for only 34 percent of the two-year-old boys asked any questions but 64 percent of the girls did. McCarthy's (3) figures show a similar difference, the percent of questions asked to sentences used being for her eighteen-months-old group, .4 for the boys and 4.7 for the girls and for the twenty-four-months-old group, 2.8 for the boys and 5.3 for the girls.

Comparing the sexes in the two situ-

ations, we find that there was no difference in the case of the boys as to the percent of children who asked questions, 80 percent of the boys using questions in each situation but there was a marked difference in the case of the girls. In situation A, 93 percent of the girls and in situation C, only 77 percent asked questions. This difference of 16 percent is 2.9 times its standard deviation giving 998 chances in a thousand that it is a true difference. However, when with adults, the boys who asked any questions used so many more in proportion than did the girls that the percent of questions asked to sentences used in situation A was six more for the boys (19 percent) than for the girls (13 percent). The boys asked more questions in situation A but there was practically no difference in the two situations for the girls.

At each age level the proportion of questions to sentences increases up to the oldest age group studied in which case there is a drop (see table 1). As there were so few cases in this group it would mean nothing, were it not that the same drop occurs in both situations, when the percentages are distributed by half-years, in another short series of records of bilingual children and at the corresponding mental age in situation C when percentages are calculated for each Mental Age. From each full-year age level from two to five years, the gain in percent of questions asked to all sentences used in the records is highly significant, the smallest difference, that between two and three years, being 3.1 times its standard deviation.

Further corroboration is found in the cases observed more than once. The 36 children from whom repeated records were taken showed the same tendency to ask more questions as they grew older up to four-and-a-half years after which there was no further gain.

From a mother's diary records of her 8 children which included random samplings of their conversation, all the sentences were taken and the percent of questions for each half-year calculated. Adding the repeated records for these children to the 36 in this study we find an irregularly increasing percentage of highest records occurring at each age up to four-and-a-half years where fifty-four percent of the records of the children for whom records were available at that age showed the highest percent of questions for each child occurred at four-and-a-half. At five years, only 38 percent, at five-and-a-half, 12 and at six years, 20 percent of the records were the highest for the particular child concerned.

This falling off might be due to lessened necessity to use questions as an attention-getting device as a greater variety of such devices are learned by children or as a result of their questions being ignored or answered unsatisfactorily or their learning other ways of satisfying their desire for knowledge.

Of the 305 records taken, 82 percent included questions. Most of those not containing questions were those recorded for the younger children. Only 49 percent of the two-year-olds asked questions; but 83 percent of the three-year-olds, 93 percent of the four-year-olds, 95 percent of the five-year-olds and 93 percent of the oldest group did. The difference between the first two percentages is significant being 4.4 times its standard deviation.

TABLE 1

Frequency of questions asked

	AT 2	3	4	5 YEARS	66–72 MOS.	ALL AGES
Number of children	65	75	75	75	15	305
Of boys	32	35	39	40	6	152
Of girls	33	40	36	35	9	153
In situation A	25	25	25	25	7	107
In situation C	40	50	50	50	8	198
Number of sentences used by all children	2,483	5,658	6,233	7,701	869	22,944
Boys	797	2,851	3,283	4,575	285	11,791
Girls	1,686	2,807	2,950	3,126	584	11,153
In situation A	968	2,881	2,356	2,914	334	9,453
In situation C	1,515	2,777	3,877	4,787	535	13,491
Number of questions asked by all children	185	550	794	1,471	95	3,095
Boys	47	261	419	922	14	1,663
Girls	138	289	375	549	81	1,432
In situation A	88	279	352	774	36	1,529
In situation C	97	271	442	697	59	1,566
Per cent questions of sentences for all children	8	10	13	19	11	13.4
Boys	6	9	13	20		14
Girls	8	10	13	17		13
In situation A	9	10	15	27	11	16
Boys	10	8	18	31		
Girls	9	11	13	20		
In situation C	6	10	12	15	11	12
Boys	3	10	11	13		
Girls	8	9	12	16		
Percentage of children asking questions all children	49	83	93	95	93	81
Boys	34	89	95	95	83	80
Girls	64	75	92	94	100	82
In situation A	60	96	96	100	86	88
In situation C	42	76	92	92	100	78
Per cent of questions asked in situation C but directed to adults	56	36	28	25	17	28
Bilingual series						
Number of cases	5	15	9	10	6	46
Number of sentences	267	1,093	442	598	707	3,107
Number of questions	13	112	49	50	65	289
Per cent of questions	5	11	11	8	9	9

For 200 of the children, mental test records were available. Using only these records and distributing them according to mental age, the percent of questions asked increased quite regularly from 5 percent at two years to 17 percent at five years, falling to fourteen percent at six years of mental age, but arising again for the 14 children of seven and eight years mentally. The drop is found only in the case of records taken in situation C, but in situation A, the gain is but 1 percent from five to six.

FORM OF QUESTION

Interrogative words were used to introduce 1085 or 36 percent of the 3000 questions asked by the children two to five years of age. Nineteen percent or 559 questions sought corroboration of the child's statement or approbation of his words or actions and were stated in such forms as: "She isn't making pie, is she?" (Girl of forty-one months) "Dat make 0, don't it?" (Boy of forty-four months) "Isn't this a nice dress?" (Girl of sixty-three months). The remainder of the questions began with the copula, or an auxiliary verb, or some subordinate clause or were asked merely by inflection of voice. Examples are: "Do buttons go here?" (Girl of forty-eight months) "May I take the beanbag out?" (Girl of sixty-three months) "Is this the right way?" (Girl of sixty-three months) "If Mary dies, will that cotton go to heaven?" (Boy of forty-nine months) "Mama home?" (Girl of twenty-nine months).

The use of interrogative words decreased from 49 percent of all questions asked at two years to 37 percent at five years (see table 2). This decrease in age is in line with Davis's (1) finding that adults used fewer interrogative words than did children. The difference in the use of such introductory words in questions in the two situations is negligible, only 2 percent; and the proportion of such words to questions was the same for both boys and girls.

Questions seeking corroboration or approbation were used with increasing frequency with growth in age, the proportion rising from 9 percent at two to 23 percent at five, the difference between these two proportions is more than 6 times its standard deviation and is highly significant. The difference in their use in the two situations is also significant; this type of question being used in 23 percent of the questions asked in situation A but in only 14 percent of those asked in situation C. The boys used this type in 21 percent of their questions, the girls in but 16 percent of theirs. The difference in this case is also significant being 3.5 times its standard deviation but the difference is not found at all ages for at two and five years the girls used more corroborative questions.

Of the particular interrogative word used *what*, occurring in 12 percent of all questions and *where*, which occurred in 11 percent of all, decreased in proportion with age quite regularly and significantly. *Who*, *whose* and *which*, which together introduced but 2 percent of all questions showed no correlation between frequency of use and age of child employing them. *How*, used in 6 percent of the questions, *when*, in 1 percent, and *why*, in 4 percent of all questions increased regu-

larly with age, the difference from two to five years being more than three times its standard deviation in the case twice and by the same child, a precocious girl of twenty-nine months with an I.Q. of 138.

TABLE 2

Form and function of questions asked

	AGE IN YEARS				IN SITUATION		BY		BY ALL CHILDREN
	2	3	4	5	A	C	Boys	Girls	
Number of children	65	75	75	75	107	198	152	153	305
Number of questions	185	550	794	1,471	1,529	1,566	1,663	1,432	3,095
I. Causal questions, per cent	3	4	7	10	11	5	10	4	8
II. Reality and history: Facts, time and invention, per cent.	6	10	16	16	17	12	16	13	14½
Place, per cent	32	22	11	8	10	15	11	15	12½
III. Actions: Imperative, per cent	2	9	11	10	6	14	10	10	10
What say, per cent.	8	7	6	4	4	7	6	5	5
Other acts, per cent.	18	27	31	35	34	28	29	33	31
IV. Name, per cent	20	11	4	2	5	6	4	7	5
V. Classification and evaluation, per cent	10	9	11	9	9	11	10	10	10
VI. Rules, per cent	0	0	1	2	1	2	1	1	1
VII. Calculation, per cent.	0	0	2	4	4	1	4	1	2
Corroboration and approbation, per cent	9	9	20	23	23	14	21	16	19
Interrogative words used									
What, per cent	20	21	17	11	14	16	15	15	15
Where, per cent	26	20	9	7	7	11	8	13	11
How, per cent	1	1	4	9	9	3	8	4	6
Why, per cent	1	1	3	6	5	2	5	2	4
Who, whose, which, per cent	1	3	3	2	2	3	2	3	2
When, per cent	0	0.2	0.6	0.8	0.5	0.6	0.4	0.8	0.6
What for, per cent	0	1	1	2	1.6	1	1.5	1	1
All interrogative words, per cent	49	46	38	37	41	39	40	40	40

Note: 2 questions, 1 of modality and 1 of logical reason not included in table.

of *how* and *why*. Of these last three interrogative words, only *why* was used by the two-year-old group and that but

FUNCTIONS OF QUESTIONS

For this analysis, Piaget's (4) classification was used with a few altera-

tions; not subdividing causal questions so finely as, with our younger children, so few samples of this type were secured; and including under actions and intentions, two special groups. The first of these special groups was composed of those questions that asked for the repetition of another's remarks such as "What did you say?" or the more frequent though less courteous "Huh?" The second group consisted of those questions that partook of the nature of imperatives such as: "Don't take mine, will you?" (Girl of forty-one months) "Can we take this car?" (Boy of fifty-two months) "Will you hold this?" (Girl of forty-three months). Both of these special groups although somewhat different in type from other questions expect a response and even seek for information at times but their inclusion under separate headings makes it possible to consider the more purely interrogative sentences by themselves. (See table 2.)

Piaget separates questions of cause introduced by *why* from such questions not so introduced. These two groups were approximately equal if all questions were considered but if the age groups are considered separately, the introductory word *why* was used less frequently in the causal questions from two to four years but more so at five years. Both types of causal questions numbered 236 altogether or 8 percent of all questions. In situation A, they composed 11 percent and in situation C but 5 percent of all questions asked. Boys at all ages asked more questions of this type than did girls, the percent of such questions being ten for the boys and four for the girls. Both the differences between sexes and between situations are significant, being in each case over 6 times their standard deviation. Piaget's case, a boy talking with an adult, used 18 percent of this type of question. Our five-year-old boys talking to adults used 16 percent. As Piaget's case was studied from six years three months to seven years one month, the somewhat larger percent is what would be expected on account of his greater age. Piaget's case asked more questions concerning natural phenomena and ours more about manufactured articles; a difference that is due to the tendency to confine questions to some extent to the immediate situation for his case was talking to his escort on walks outdoors and the majority of our records were taken indoors while the child was engaged with toys, puzzles, picturebooks, drawing and similar activities. The boys in Davis's (1) study also asked more causal questions.

The next large division of questions in Piaget's classification is that of Reality and History. The five categories under that head showed such marked differences in trend that they were studied separately. Questions of place comprising 13 percent of the total were usually introduced by the word *where* and were the most frequent of all at two years when they made up almost a third of the questions asked. They decreased rapidly in proportion to 8 percent at five. They were more frequent in situation C than in situation A and were used relatively more often by girls than by boys. Only one question of modality, "Was it real?" asked in situation A by a girl of forty-seven months was found in the entire series of questions. The proportion

of questions of fact, time and invention, 14 percent of all, increase with age; the first type only to four years and the second type occurring for the first time at three years. They were found more frequently in the boys' records and were used relatively more often in situation A but the latter difference only is significant.

Examples of these types are: *Fact* "Did it freeze?" (Girl of forty-one months) "Is this their lunch?" (Girl of thirty-three months) *Time* "This is tomorrow, ain't it?" (Boy of forty-four months) "What time is it?" (Girl of fifty-six months) *Invention* "Is that un (a toy) squealing?" (Boy of forty-six months) "Spool, you are getting naked, aren't you?" (Girl of seventy-one months) *Place* "Where daddy?" (Girl of eighteen months) "Where you buy dat baby doll?" (Girl of thirty-one months).

Questions concerning human actions and intentions include the largest proportion of all questions, 46 percent. Those that were imperative in purpose but stated in the form of questions increase from 2 percent at two years to 11 at four years, falling to 10 at five. The increases from two to four or five years are significant, being in each case over six times the standard deviation. The requests for repetition of remarks however, fall regularly from 8 percent at two to 4 percent at five. Evidently as the child grows older, he understands better and does not need to have statements or questions repeated to him so often. These two forms are used more frequently in situation C and show no sex difference in frequency of use. The other questions of action or intention increase significantly in proportion from 18 percent at two years to 35 percent at five, and are used significantly more often by girls and in situation A. Examples are: "'Ove Turley too?" (Girl of twenty-seven months) "Will you buy medicine? Can you 'member?" (Boy of fifty-four months) "What are you writing?" (Boy of twenty-nine months) "Know Uncle Ed?" (Girl of thirty-nine months).

Piaget's fourth large category "Questions on rules" were used by only the four and five-year-olds. There were only 39 of them in all or about 1 percent of all questions. No sex difference was found but about three-fourths of these questions were asked in situation C. Examples are: "How do you spell Kathleen?" and "At Home, it would be all right, wouldn't it?"

The fifth big group of questions is that of classification comprising questions of name, logical reason and classification. Those questions asking simply for the name of an object or person composed one fifth of the questions asked by two-year-olds, ranking third in frequency at that age. The youngest child to ask any questions in situation C, a girl of nineteen months used this kind of question seven times in the course of an hour's observation, and only three other questions which were all questions seeking repetition of the answer to her questions. She was still using one-word sentences and her vocabulary was very limited so her question took the form of "Dat? Dat?" repeated until an answer was given as she pointed at the child or object of which she desired the name. Another girl in situation A, twenty-nine months old with a much larger vocabulary still

used but one word "Tat?" when asking for names. Although this form of question was so frequent in this youngest group it comprised but 5 percent of all questions and occurred but one-tenth as frequently at five years as it had at two. Seven percent of the girls' questions and 4 percent of the boys' were of this type and it occurred slightly more often (one percent) in situation C than in situation A. Examples are: "What's in brush?" (Girl of forty-one months) "What's your name?" and "What's the name of this?" (Boy of fifty-four months).

There was only one question of logical reason in our series, nor did Piaget find it often; only 6 times in all the 750 questions asked by his case who was older than any of ours.

The questions of classification and evaluation remain the most nearly constant in proportion of any type. They compose 10 percent of the total number and vary no more than a minimum of 9 and a maximum of 11 percent at any age, in either situation or with either sex. Examples are: "What kind are these?" (Girl of thirty months) "That was joke, wasn't it?" (Boy of forty-three months) "Was the steamer also a boat?" (Boy of forty-two months) "Ain't it a shame for him to be a boy? .... With all them curls." (Boy of fifty-four months) "Aren't they funny men?" (Girl of forty months) "Isn't this a nice dress?" (Girl of sixty-three months).

The last category used is that of questions of calculation. There were 73 of these in our series. They were over 4 times as frequent in situation A and in boys' records as in situation C and in girls' records. They were found at only the upper age levels and twice as often at five as at four. Examples are: "How many have I got?" "How many minutes is ten o'clock?" and "If somebody gave Mary 2 apples and me 5, how many would that be?"

SITUATION

Whether the child was in situation A or C, his questions were in 94 percent of the cases concerned with some object, action or person either in the immediate situation or desired to be there by the child. Only 174 of the entire series of questions were not thus closely concerned with the child's immediate surroundings; and of these, there were but 52 which were not associated with some preceding conversation, action or the particular place where the child happened to be. Thus, Kathleen, forty-three months old asks, "I don't need to take a nap, do I?" She was eating her breakfast and after each other meal during the day, bed was in order. That this was her association is evident from her next remark, "When you've already been in bed, you don't need to take a nap." The questions apparently unconnected with the immediate surroundings included questions about time, as "What day's tomorrow?" (Bobby at forty-six months) people not present, as, "Know Frank's sister?" (Doris at forty-one months) God, as "Who made God?" (John at four years) the knowledge of others as to the child's experiences as, "Know what my daddy told me?" (Carolyn at fifty months) connected with his romances as, "Don't you wish your knife would get up and butter your bread for you?" (Harry at five years) criticisms more wisely not ex-

pressed when the person criticized was present as when Margo (seventy months) waited until mother was safely out of the house before asking at a time when the question seemed quite irrelevant, "Don't you think mother looks silly in that new hat?"

CAUSAL QUESTIONS

Isaacs (2) gives an outline for the study of children's "why" questions applicable to those questions that are the same in nature as those introduced by "why" even if that word does not occur in the question. His outline would include some that Piaget classes under Actions and Intentions, which class he states might be subdivided into questions about the causes of actions and the other about the actions themselves. For an analysis of our questions according to Isaac's outline, we have added to our causal questions as treated above, others from the first subdivision of this third large group of Piaget's making a total of 300 causal questions. We also gathered for comparison 60 more causal questions taken from two other sources: a number of records of bilingual children which had been recorded exactly as those in our main series; and some diary records of her 8 children kept by the mother referred to above. (See table 3.)

Isaacs divides causal questions into 4 major groups. The first class is Affective and Expressional. It is similar to, though broader than, Piaget's subhead of Contradictory. The child, helpless, surprised, vexed or in protest demands the reason for the interference with his purposes or expectations. These questions often consist of the single word "Why?" in response to a command. Thus Evelyn when she notices that Daddy is leaving without her complains, "Why?" and Jackie refused permission to play outdoors in the rain protests, "Why?" Longer sentences of this type are: "Why don't you do it yourself?" (Girl of fifty-nine months, very much vexed) "Why don't you give me easy things?" (Boy of sixty-five months) "What's the matter with the old ball?" (Girl of fifty-

TABLE 3

"Why questions"

	MAIN SERIES					ALL CASES	IN SITUATION		SPECIAL SERIES				
ASKED AT YEAR	2	3	4	5	6		A	C	3	4	5	6	All
Total number of questions	7	18	60	209	6	300	226	74	26	18	12	4	60
I. Affective and expressional, per cent	57	22	8	13	83	15	12	23	31	17	8		18
II. Epistemic, per cent	0	17	52	47	0	44	52	20	19	33	50	75	33
III. Teleological and motivational, per cent	43	61	40	38	17	40	34	42	54	44	42	25	47
IV. Justificatory, per cent				2		1	2			6			2
Word "why" used, per cent	29	33	33	41	17	38							

Note: In the special series no two-year-olds asked questions.

four months thwarted in her attempt at securing the ball). The earliest age at which this type of questions was found in our records was twenty-nine months, when the four questions of this kind made up 57 percent of the total of 7 causal questions. Not one such question occurred in our special series before three years. This class of questions made up 15 percent of the main series and eighteen percent of the special series.

Issacs explains his second category of Epistemic questions as containing questions that occur when the child finds that his immediate experience turns into a sense of something wrong with knowledge and seeks the explanation. It may be because he finds a contradiction of anomaly and seeks its resolution as when five-year-old Marvin counting his beads inquires, "There's five there and I had five before, how comes that?" or five-year-old Ruth amazed at the information that God was not born exclaims, "How could he live?" The question may be asked in an attempt to learn the missing general rule for an unexpected or odd fact, as when Mary, at forty-two months asks concerning her shadow, "Why Mary walk on the floor?" Again noticing a difference or contrast, the child seeks the delimiting rule as when Paul, fifty-six months old demands "Why are they little girls? Why aren't they little boys?" Or the child does not understand some deviation from customary usage as when four-year-old John asks, "Why doesn't he spank him?" (since he is bad). Or he may be seeking the determining factor or law in the case as when Eugene at forty-six months asks concerning a firecracker, "How would it went bang?" and five-year-old Arthur inquires, "How do you set the clock?" or when five-year-old Bobby, not quite certain of the cause assumed says, "God makes it rain, doesn't He?" The question may be the result of a desire to discover what event determined a certain occurrence as when five-year-old Gloria asks, "What were you laughing about?" or Dicky, at forty-four months, solicitously inquires, "What made you sore, lady?"

The first 3 of the above subdivisions Issacs considers primary and the rest as derivative or causal and quasi-informational. This Epistemic group comprised 44 percent of the main series of causal questions and 33 percent of the special series. This type was much more used in situation A, where the proportion was 52 percent of all causal questions but the proportion of these questions in situation C was but 20 percent.

The third category is divided into Teleological and Motivational. The latter subdivision when introduced by *"Why"* corresponds to Piaget's class of Psychological Motivation; but, as he throws the corresponding questions when not introduced by *"why"* into the large group relating to Human Actions and Intentions, his rules of classification result in a smaller group. Questions under the first subhead, teleological, seek the purpose or function of an action or object as in Billy's question, asked at sixty-three months, "Why ambulance go?" and David's, asked at fifty-three months, "What are snakes good for?" and Paul's inquiry, made at fifty-six months, "These nails are just to nail it together, aren't

they?" Teleological questions composed 9 percent of the main series and 7 of the special series.

Under the heading of Motivational questions which seek the motive or intention of another are included 31 percent of the main and 40 percent of the special series. This type was more common in situation C where forty-two percent of all questions were so classified as compared with 27 percent of those in situation A. Examples are, "Why don't you take your other overshoe off?" (Boy of forty-nine months) "Why do you want to see how good a bead-stringer I am?" (Boy of fifty-four months) "Why did you move your bench?" (Boy of five years) "Why she buy that baby doll?" (Girl of thirty-one months).

The last category of justificatory questions was very scantily represented. Only 4 questions of the main series and 1 in the special series were of this type and all of these were asked by five-year-olds. In this class of questions, the child demands the grounds for or reasons for rules, statements or beliefs. In Paul's question, "Why is this a puzzle?" he was seeking the reason for a statement just made to him.

SUMMARY

The most striking differences due to age found were:

1. The number and percentage of questions to total number of sentences increased with each half-year up to four years when both number and percent fall. The percentage of children asking questions was 49 at two years and increased each year until five when 95 percent of the children asked questions.

2. The same increase in percent of questions to total number of sentences used was found for mental ages from two to five years, a drop at six years mental age and a rise again at seven years.

3. The most frequent interrogative words used by the youngest children were *what* and *where*. *How*, *when* and *why* were not used at all at two years but increased in frequency at each age level studied while the what and where questions correspondingly decreased in relative frequency.

4. Almost half of the questions asked by two-year-olds were introduced by an interrogative word but only a third of the questions at five.

5. Questions that were most frequent at two years and decreased in relative frequency with age were, in order of frequency at two years:—those of place which inquired as to the whereabouts of persons or objects, and those asking for the names of persons or things.

6. Questions that increased significantly in proportion with age from two to five years were questions of fact (e.g. Did it freeze?) time, invention, concerning number and calculation, concerning human intentions or actions (e.g. What are you doing?) and causal questions.

The most striking differences due to sex found were:

1. Girls asked more questions at two years.

2. Boys asked more causal questions and used *how* and *why* more than the girls did.

3. Girls asked more questions con-

cerning social rules, the names of things and more questions of place.

The most striking differences due to situation found were:

1. Many more questions proportionately were asked in situation A than in situation C and there was a tendency especially among the younger children in situation C to direct many questions to adults.

2. Questions concerning human actions or intentions except when merely asking for repetition of question (What did you say?) or as a variation of the imperative were more frequent in situation A. So were questions of fact, time, invention, cause, calculation and corroboration.

3. The most frequent questions asked in situation C were questions of place, name, classification, and the variation of imperative type.

Those differences favoring boys and situation A are for the most part in the same direction as those differences noted in the older children.

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An Experimental Study of Certain Motor Abilities of Stutterers

GRENAFORE WESTPHAL

THE problem proposed for study herein is: In what degree is there a significant difference in the performance of certain motor tests by children who stutter compared with children who do not stutter?

The word "stutter" as used in this study means "an intermittent inability to produce voiced sounds, accompanied by severe cramps of the diaphragm, larynx, tongue, or all three of these speech organs" (8).

Stuttering seems to be as old as the speech of man. Few subjects have been the topic of so much speculation and philosophy. Despite much controversial literature on the etiology, theories of causation, and therapy to be pursued in treating the disorder, little experimental evidence is available to establish or disprove these contrary ideas. The case is stated by Scripture (12) in no uncertain terms:

> "Stuttering or stammering is usually regarded as incurable and not more than five per cent of treated cases ever fully recover, for the pathology of the disease has never been established and no rational methods of treatment have been found."

A connection between stuttering and muscular activity is noted by Borden and Busse (3) who describe the situation thus:

> "The stutterer is in all probability suffering from unconscious psychic conflicts, the pathologic nature of which is made manifest not only by his speech defects but by a hundred other nervous symptoms ranging from facial and bodily contortions, blushing and general embarrassment to phobias, obsessions and compulsive acts."

A symposium on stuttering is recorded in the Quarterly Journal of Speech. In an address before the American Society for the Study of Disorders of Speech in convention in Detroit in 1931, Russell (11) implies a direct connection between the neuromuscular set-up of the stutterer and his difficulty. Dr. Russell says no stutterer is troubled when he sings. He adds a point which bears upon our problem.

> "Speech broken up into syllables each articulated along with an accompanying voluntary muscular movement of almost any kind whether of the arm, foot, breathing or other similar muscles controlled from non-speech areas of the brain can be trained to function in all stutterers and stammerers without the usual block or impediment at least so long as the voluntary control is kept."

The stutterer produces a complete inhibition or reduction or reinforcement of voluntary flexor-extensor movements of the hands and feet at the time of the speech block, according

to Herren (7). No significant differences in the tapping of stutterers and non-stutterers is reported by Blackburn (2). However, in the control of speech structures he concludes that stutterers have a disability. In strength of grip of stutterers and non-stutterers a difference is reported by McDowell (8), who reports that the non-stutterers scored higher by .2635 pounds pressure for the right hand. The stutterers, however, were better with the left hand by .2630 pounds pressure. The experimental coefficient is the same for both, .03. The proportion of greater strength in the left hand is 24 per cent for stutterers and 14 per cent for the non-stutterers. The standard deviation is .0893 and the experimental coefficient .4.

The phenomenology of stuttering was discussed by West (14) in an address before the American Society for the Study of Disorders of Speech in convention in Detroit in 1931. Citing a survey of 10,268 stutterers in public schools, he is reported as saying that the

"incidence of stuttering increases during the years when articulatory disorders are on the decrease, suggesting that stuttering is associated with etiological factors differing from those producing disorders of articulation as such. Stutterers show no appreciable difference in I.Q. from non-stutterers if we assume the normal range to be from 90–110.

"The ratio of male stutterers to female stutterers by grade follows: one female to 3.1 males in the first grade, in the second, 3.4, third, 3.6, fourth, 4.2, fifth, 4.2, sixth, 4.0, seventh, 4.8, eighth, 3.7, ninth and tenth, 3.7, eleventh and twelfth, 5.5. It increases as puberty is approached, then falls, and rises sharply."

Since stuttering is more prevalent among males than females, only males were used in the present study. There is a suggestion here that a possible sex-linked heritable factor may be involved. John Madison Fletcher (6) found galvanic changes in stutterers. He concludes:

"1. The motor manifestations of stuttering are found to consist of asynergies in the functioning of the three musculatures of speech,—breathing, vocalization and articulation."

Fletcher goes on (page 248) to say:

"2. Accompanying these asynergies there are also to be found tonic and clonic conditions of other muscles which are not involved in normal speech."

Much interest centers about the theories of cerebral dominance advanced by Samuel T. Orton and L. E. Travis (10). Differences between stutterers and non-stutterers are reported in their studies of action currents. In the time and leads from the forearms of both arms of right-handed stutterers and non-stutterers differences were found, the greater number of leads being from the left hand in stutterers and from the right in non-stutterers. Stutterers showed a greater number of simultaneous leads. Ambidexterity and delayed speech development was the subject of an early study by Nice (9), who described seven ambidextrous children who were retarded in speech development. The author does not go so far as to say that some ambidextrous children may not be agile and precocious in speech development. No proof of constant co-existence between ambidexterity and slowness in speech can be affirmed from this study.

A tendency toward reversing the usual style of writing has been thought

by some writers to accompany stuttering. This "mirror writing" refers to writing which is reversed so that it can be read easily by holding it before a mirror. Fagan (5) and Travis (13) find it more prevalent among stutterers. Fagan found 23 per cent of right-handed normal adults (69 cases) and 58 per cent of right-handed stutterers (50 cases) reverse one or more characters in simultaneous writing of letters and digits. Travis quotes a study of 283 stutterers of ages varying from five to thirty-five years, in which it was found that 70 per cent of the stutterers wrote spontaneous mirror writing. He goes on to say (page 176): "Although it occurs in relatively few right-handed normal speakers it is almost the rule for stutterers." The results of the study herein reported do not agree with these findings. More non-stutterers than stutterers were found to reverse digits written simultaneously. Whether errors in sampling, or the closeness in matching other factors has contributed to this result, it is impossible to say.

The present study was undertaken without bias or the expectation of proof of any hypothesis, simply to discover if possible whether any marked differences in motor abilities measurable by our tests could be found among a carefully matched group of stutterers and non-stutterers.

The method of study is a comparison of the means and their sigmas obtained in the data given below from the study of 52 individuals arranged in 26 pairs of boys one of whom stuttered and one of whom had no speech defect. The subjects ranged in age from eight to seventeen years, the mode being twelve. In I.Q. as measured by the Stanford revision of the Binet test the range was from seventy-two to one hundred and twenty-seven. Similar racial inheritance and environment prevailed. The tests given were:

(1) The Smedley dynamometer measure of grip given alternately three times on three separate days.

(2) Bead tossing once with each hand on three separate days, alternating the first hand, and interpolating an interval of time between the use of the first hand and that of the second. Five beads were tossed with each hand.

(3) The Goddard-Norsworthy arrangement of the Seguin board. Choice of hands was observed on the first trial; for the second and third the subject was instructed which hand to use.

(4) Simultaneous writing of digits was administered to the subjects while they were blindfolded. The time and the number of reversals is recorded.

(5) The Stoelting nine-hole steadiness plate, alternating the hands. The score is in terms of contacts so that a low score shows better control than a high score.

Height and weight in school clothes without shoes are given as comparable units.

The experiments were conducted in the rooms of the Guidance Laboratory, Teachers College, Columbia University in the city of New York, on March twentieth, twenty-first, twenty-

seventh and twenty-eighth, and April third and fourth, 1933. One further session, on April twelfth, was needed to complete the records of five boys who had missed one previous session because of illness. The tests were given by the experimenter assisted by members of speech classes in Teachers College who had been previously instructed in the manner of administering the tests.

The subjects were 26 "pairs" of boys from the Hebrew Orphan Asylum. Each stuttering boy was matched with a non-stuttering boy for age, for intelligence as measured by the Stanford Revision of the Simon-Binet test, for environment and racial inheritance, and, of course, for sex. Rather close matching was adhered to, that is, within five points Binet, and six months in age. The presence of a stutter was determined by the recorded diagnosis of a speech defect.

Each of the boys was given a blank upon which scores were recorded as each test was completed. The partners, that is, two boys paired for the experiments as to the factors given above, were tested sequentially, and variables, such as which hand was used first, and whether the stutterer or his partner was tested first were arranged by alternation. After the first hand of bead tossing, the Smedley dynamometer was introduced, then the second hand of bead tossing, then the third test which was not repeated at three sessions. At the first meeting, the third test was the Seguin board, at the second, simultaneous writing of digits, and at the third, the Stoelting plate. Although there were six meetings, each boy appeared three times. The number, 52, was divided for ease of handling into two groups of 13 pairs, the choice being made alphabetically by the last name of the first member of each pair.

A word of explanation concerning the tests and the purpose of each may be helpful in reading the tables. According to Whipple (15) the dynamometer is used to secure an index of general bodily strength, to secure an index of right handedness in conjunction with other tests, strength of grip, and for comparative purposes generally. The instrument consists of a dial with a pointer on which is indicated the pressure in kilograms exerted by the subject to bring the two hand grips on the stirrups together. It is possible to adjust the difference between the stirrups so as to secure the maximal grip. Following the recommendations of Binet and Vaschide (1) and of Engelsperger and Ziegler (4), all dynamometric measurements in the present study were made in the presence of other subjects so that competition might induce the best possible efforts.

The Seguin form board was given to detect the choice hand, that is the hand which the subject would elect to use when not instructed which hand to employ, to compare the performance of right and left hand, to compare the motor dexterity or skill, and eye-hand coördination of stutterers and non-stutterers. The Goddard Norsworthy arrangement is familiar to educators and consists of a board with hollow spaces into which fit blocks of corresponding shape, such as the star, lozenge, elongated hexagon, triangle, and so forth.

Bead tossing was introduced as a further check on eye-hand coördination with an added element of rhythm, and for comparative purposes. The boys stood six feet away from a target consisting of four concentric circles lined with different colors of cambric and surrounded by a square black apron. From this distance each threw five orange beads at the bull's eye at the rate of one every three seconds, the rhythm being set by a mechanical click operating by electricity independent of the examiner who gave the signal to begin. This test was repeated at each session to avoid if possible the factor of temporary emotional states, that is, the feeling of uncertainty in a strange situation, or an uncoöperative mood which might dominate the reactions of a subject on one occasion but which would not appear significant in an average of three sessions.

Simultaneous writing of digits was used to find the difference in the number of reversals made by stutterers and non-stutterers, and the difference in speed for the act. No visual cues influenced the writing since each boy was blindfolded.

The steadiness tester was the Stoelting nine-hole plate, used to measure the amount of involuntary movement which appears when the finger, hand, arm or body as a whole is held as nearly motionless as possible, and to obtain an index of the ability of each hand for comparative purposes. The subject stood before the plate which is a metal casting with one face at an angle of forty-five degrees, and pierced with nine holes of graduated diameters. The height was adjusted so that the angle of the elbow was about 100 degrees and the arm was clear of the body. The examiner held a stopwatch and signalled the subject when to begin and when to stop, the interval being fifteen seconds. The number of contacts was recorded on an electric counter. After using the first hand on the first hole, the second hand was used for the same one, and alternation of beginning hand was observed as each pair was tested.

Table 1 presents the differences between stutterers and non-stutterers in

(a) height
(b) weight
(c) strength of grip as measured by the Smedley dynamometer
(d) eye-hand rhythmic coördination as shown in bead tossing
(e) reaction time in the manipulations involved in the Seguin form board test.

In none of these functions do the critical ratios reveal a significant difference. Reading across from left to right, the first column contains the item for which a measure is given, the second contains the average or mean score of the stutterers for the item, next to the mean is its measure of variation, the sigma of the mean; the fourth column contains the non-stutterers' mean and the sigma of the mean; the fifth, the difference between the means and the sigma of the difference; and in the last column is found the critical ratios all of which are less than three and therefore not statistically significant.

Table 2 shows the results for the Stoelting nine-hole plate. Although no significant differences in steadiness for right or left hand are revealed, an

interesting trend may be observed. The scores are recorded in terms of contacts, so that a large score shows less steadiness than a low score. On the first holes the stutterer is inferior to the non-stutterer, but on holes four, five, and six he surpasses the non-stutterer, and on the seventh hole the scores are close.

be needed to substantiate the finding of real statistical differences.

The trend seems to be for the non-stutterers as a group to make scores that are better than those for stutterers.

The non-stutterers are heavier, (b) are stronger with the right and left hand, (c) and have better eye-hand coördination in all of the functions.

TABLE 1

The means and standard deviations on various functions for matched groups of stutterers and non-stutterers with the difference between the means and the critical ratios

ITEM	STUTTERERS		NON-STUTTERERS		DIFFERENCE		$\frac{M_1-M_2}{\sigma \text{ Diff.}}$
	Mean	σ Mn	Mean	σ Mn	Mean	σ Diff.	
Height	56.92	1.15	56.83	1.22	.09	1.67	.05
Weight	88.52	4.81	89.46	5.96	.94	7.66	.12
Smedley:							
Right	23.97	2.18	24.96	2.21	.99	3.10	.32
Left	22.52	1.94	23.75	1.98	1.23	2.77	.44
Bead Tossing:							
Right	44.92	7.30	48.30	7.00	3.38	10.10	.33
Left	22.84	6.15	29.92	6.91	7.08	9.25	.76
Seguin Board Choice:							
Right	23.90	2.37	24.17	1.60	.27	2.85	.09
Left	21.00	3.57	21.60	2.00	.60	4.09	.15
Both	19.08	2.26	19.93	2.75	.85	3.56	.24
Right	21.40	2.85	18.43	1.11	2.97	3.06	.97
Left*	25.04	6.71	18.55	.72	7.49	6.74	1.11

* One extreme score suggests that the median may be a more reliable measure on this test:

	Median	σ Mdn	Median	σ Mdn	Diff.	$\frac{\sigma \text{ diff}}{\text{Median}}$	$\frac{Mdn_1-Mdn_2}{\sigma \text{ diff. Mdn.}}$
	17.9	.8375	17.2	.9000	.7	1.22	.57

Table 2 is arranged like table 1. Wherever right and left appear the reference is to the hand used for that part of the test.

In no instance have the differences between the scores made by stutterers and those made by non-stutterers been reliable. This does not contravene the fact that there may be differences so small that large numbers of cases will

There is no instance in which stutterers as a group are better than non-stutterers with the possible exception of the Stoelting Plate data.[1]

[1] It must be pointed out that the data on the Stoelting plate for holes eight and nine may be spurious due to the fact that some of the subjects violated the conditions of the experiment by keeping the needle in contact with the plate.

The consistency of the direction of the difference implies that the probabilities are that stutterers as a group are not as efficient in the eye-hand coördinations, strength, and manipulations involved in the tests given as are the non-stutterers. The overlap of non-stutterers in this study is greater than the number of reversals made by stutterers, and that, therefore, simultaneous writing cannot be considered in the light of this evidence as a valid diagnostic test for stuttering.

The limitations of the data must

TABLE 2

The means and standard deviations on various functions for matched groups of stutterers and non-stutterers with the difference between the means and the critical ratios

Stoelting plate

HOLE	STUTTERERS		NON-STUTTERERS		DIFFERENCE		$\frac{Mn_1 - Mn_2}{\sigma \text{ Diff. Mn.}}$
	Mean	σ Mn	Mean	σ Mn	Mean	σ Diff.	
Right hand							
1	2.92	1.21	.96	.32	1.96	1.25	1.57
2	10.30	2.49	7.26	1.09	3.04	2.71	1.12
3	13.11	2.26	14.80	1.77	1.69	2.87	.59
4	18.69	2.84	21.88	1.78	3.19	3.35	.95
5	29.07	3.19	32.46	2.43	3.39	4.00	.85
6	31.42	3.31	36.84	2.72	5.42	4.28	1.27
7	37.46	2.97	37.34	2.47	.12	3.86	.03
8	36.92	2.65	39.30	2.15	2.34	3.41	.69
9	38.57	2.68	39.19	2.80	.62	3.87	.16
Left hand							
1	4.61	1.51	2.38	.75	2.23	1.68	1.33
2	9.65	2.10	8.61	1.27	1.04	2.45	.42
3	17.69	2.73	15.23	2.06	2.46	3.42	.72
4	21.96	2.47	22.73	1.73	.77	3.01	.26
5	29.50	2.26	31.26	2.19	1.76	3.14	.56
6	30.96	2.99	35.76	2.47	4.80	3.87	1.24
7	36.30	2.34	35.76	2.40	.54	3.35	.16
8	37.42	2.74	42.04	2.18	4.62	3.50	1.32
9	39.04	2.72	39.73	2.65	.69	3.79	.18

The data on holes 8 and 9 may be spurious due to the fact that some of the subjects violated the conditions of the experiment by keeping the needle in contact with the plate.

the abilities, however, is so large that not one test or combination of tests used in this study would discriminate between stutterers and non-stutterers.

The scores on simultaneous writing show that while reversals occur among both stutterers and non-stutterers, the number of such reversals made by exclude generalizations which may be based upon too few cases or unrepresentative data. It is possible that the method of selection predetermined certain parallelisms it was not intended to affect.

If the implications of this study are accepted as tending to show no

measurable difference between stutterers and non-stutterers in functions of motor ability, the re-educational therapy for stuttering will probably be advanced by directing attention to some other more reliable etiological factors which may lead to a better understanding of the problem.

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The Food Preferences of Preschool Children

A Comparison of Rural Children with Children of the Iowa State College Nursery School

THOMAS F. VANCE AND VERNA M. TEMPLE

THE primary purpose of this study was to compare the food preferences of nursery school children with those of rural children. The forty children who served as subjects in this investigation ranged in age from twenty to sixty months. One-half of the children lived in a rural section in Wisconsin; the other half were members of the Iowa State College Nursery School and lived in the city of Ames. On the basis of carefully compiled record forms, the two groups were fairly comparable with respect to health, sleep, amount of play equipment and play activities.

The parents of the rural group were eighth grade graduates, with the exception of three, who were college graduates. All were fairly prosperous farmers who owned their own farms. The parents of the nursery school children belonged to the business and the professional group. They were somewhat superior educationally, but differed little from the rural group in economic status.

The major portion of the data was collected through direct observation of the children during the meal. Three meals—breakfast, dinner, and supper,—were served to both the rural and the nursery school children in their homes on three successive days. The three dinners were served to the nursery school children at the nursery school. The menus were as follows:

First day

Breakfast: Orange juice, oatmeal and milk, whole wheat toast, milk.
Dinner: Salmon loaf, boiled potato, buttered spinach, lettuce leaf, stewed tomato, bread-butter sandwich, sliced peaches, milk.
Supper: Scrambled eggs, carrot sticks, whole wheat toast, junket.

Second day

Breakfast: Stewed prunes, wheatena and milk, whole wheat toast, milk.
Dinner: Meat loaf, potato soufflé, cabbage salad, scalloped tomato, sandwich, applesauce, milk.
Supper: Cream of pea soup, toast, custard, milk.

Third day

Breakfast: Stewed apricots, shredded wheat and milk, whole wheat toast, milk.
Dinner: Liver loaf, sliced tomato, baked potato, buttered carrots, bread and butter sandwich, baked apple, milk.
Supper: Baked spinach and egg, carrot sticks, rhubarb sauce, peanut butter sandwich, milk.

To insure as much uniformity as possible in the preparation of the food

mimeographed recipes were placed in the hands of the mothers. Supplies, including a standard measuring cup, were provided by the experimenter as needed. The investigator stressed the importance of following the recipes to the letter. The mothers were urged to keep the home atmosphere as nearly normal as possible; the presence of the investigator was not to make any difference in the usual family life on those days when the plan of the study demanded her presence. Only those children were included in the study whose mothers expressed a willingness to coöperate to the fullest extent.

When the children were observed in their homes, the investigator made the record on the first day and the mother on the two succeeding days. At the nursery school the graduate students and staff members assisted with the records. The recorders used the accompanying form, entitled "Food Preference Record." A sample record has been made on this blank to serve as an illustration. The names of the foods were written in the spaces in the first line; and the order of finishing and tasting, in the T and F columns, respectively. The order of tasting for this particular child on this particular day happened to be, in order, potatoes, sandwich, lettuce, salmon, spinach, milk and tomatoes. As may be seen the order of finishing was somewhat different. The key indicates the meaning of the other symbols used. The record shows that Paul had standard helpings in every case except potatoes; he was given an extra helping of these. The record also indicates that he had to be urged to eat his spinach.

The order of tasting was recorded as soon as the child took his first taste of the food and the order of finishing, when the last of the food was eaten. All foods in the meal except the dessert were placed before the child when he sat down to the table. The relative

FOOD PREFERENCE RECORD

Child Development — Iowa State College, Ames, Iowa

Name: Paul Wallace — Date: Aug. 15, 1931

Food	Salmon				Potatoes				Spinach				Lettuce				Tomatoes				Sandwich				Milk				
Reaction	T	U	F	S	T	U	F	S	T	U	F	S	T	U	F	S	T	U	F	S	T	U	F	S	T	U	F	S	Begin 12:00
	4		5	X	1		1		5	X	7	X	3		2	X	7		6	X	2		3	X	6		4	X	
Order			E			X	E				E				E				E				E				E		End 12:17

Key: T—tasted; U—urged; F—finished; S—standard; E—extra.

Directions: Underline phrases or words which apply to your child.

A. *Appetite shown by:* calling to meal, came reluctantly, came without calling.

B. *Type of refusal:* shutting mouth, pushing food away, crying, spitting out.

C. *Physical condition:* has cold, constipated, upset stomach, rested and well.

D. *Amount of sleep:* 6–8 hours, 8–10 hours, 10–12 hours, 12–14 hours.

E. *Posture at table:* erect, slouched, twisted.

F. *Attitude at table:* cross, sleepy, happy, talkative, quiet.

G. *Additional remarks:*

position of the foods on the plate was entirely a matter of chance.

When the observations were complete, the average rank of each food for tasting and finishing was computed. If a particular food was finished first by all of the children it would have a rank of 1, if finished last it would have a rank of 4. In cases where more than four foods were served, the ranks were all reduced proportionately to fall within the range of 1 to 4. The assumption in the investigation is that the foods having the relatively low average ranks are the preferred foods. It may be stated, however, that a correlation of .61 ± .04 was obtained between the order of tasting the foods on the plate and the order in which they were finished. This correlation is somewhat lower than that of .79 reported by Vance (1).

Table 1 shows the average rank for finishing the foods served in the breakfast arranged from the most preferred to the least preferred food in the rural group. Each meal was treated as a unit in computing the average order of finishing. Hence in tables 1, 2 and 3 each food appears as many times as it

FOOD REACTIONS

Name of Child.....

After the following foods, write (L) if the child likes the food (underline food if child likes it very well); (D) if he dislikes it; (R) if he refuses it; (0) if it is never offered:

Milk.....; eggs.....; meat.....; fish.....; butter.....; cooked cereals.....; prepared cereals.....; orange juice.....; prunes.....; peaches.....; apricots.....; carrots.....; spinach.....; potatoes.....; peas.....; beans.....; asparagus.....; onions.....; celery.....; cauliflower.....; cabbage.....; beets.....; squash.....; turnips.....; brussel sprouts.....; lettuce.....; tomatoes.....; rice.....; white bread.....; dark bread.....; pancakes..... cake..... custards.....; pie.....

Reaction of the children to commonly served foods prior to the time of the investigations were determined by the use of the record form entitled "Food Reactions." The foods listed were intentionally more numerous than those served in the menus previously described. The method of preparation was ignored. The form was filled out by the mothers.

RESULTS

The order in which the children tasted the foods is not reported here. was served in all three menus. As an illustration, milk and toast appeared in all three breakfasts and each had a different rank in all three menus. Obviously the relative rank of a particular food is determined by the other foods on the menu with which it appears. That the children of both groups tended to finish the foods in the same order is shown by a coefficient of correlation of .70 ± .14.

The average finishing rank for foods served in the dinners are given in table 2. When the average finishing ranks

were correlated, the following coefficients of correlation are obtained; nursery school and rural homes −.54; rural home and nursery school home, .11; and nursery school home and nursery school .11.

The comparison of the finishing rank for suppers is shown in table 3. The correlation between the two groups is .90 ± .05.

The coefficients of correlation show that the rural and nursery school groups agree much more closely in preference in the breakfast and summer menus. As previously indicated, the correlation coefficient for breakfasts was .70 and for suppers, .90; while for the dinners, it was −.54. Between dinners in the nursery school homes and in nursery school and between dinners in nursery school homes and rural homes the correlation was .11. These decided differences between the dinners and the other two meals suggest that the nursery school experience makes some changes in the food reactions of children. Nursery school teaching as it applies to food may tend to reduce pronounced food preference. If such is the case the order of finishing the foods on the plate would be more a matter of chance than of preference. On the other hand, the negative correlation of .54 between nursery school homes and rural homes would suggest that nursery school insistence upon a clean plate and learning to like all the foods served is bearing some fruit.

TABLE 1

Comparison of the finishing ranks for breakfasts

FOODS SERVED	AVERAGE FINISHING RANKS	
	Rural	Nursery school
Orange juice	1.74	1.95
Prunes	1.94	2.40
Oatmeal	2.21	2.31
Stewed apricots	2.27	3
Shredded wheat	2.40	2.6
Milk	2.67	2.9
Milk	2.88	3.47
Toast	2.93	3.30
Wheatena	2.94	2.20
Toast	3	2.75
Toast	3	2.95
Milk	3.37	3.60

TABLE 2

Comparison of the finishing ranks for dinners

FOODS SERVED	AVERAGE FINISHING RANKS		
	Rural homes	Nursery school	Nursery school homes
Boiled potato	2.09	3.39	3.13
Meat loaf	2.30	2.10	2.35
Buttered carrots	2.41	3.16	2.55
Liver loaf	2.45	2.90	2.85
Baked potato	2.50	2.63	2.64
Cabbage salad	2.54	3.03	3.10
Stewed tomato	2.54	2.57	2.82
Sliced tomatoes	2.69	1.66	2.17
Scalloped tomato	2.70	1.97	3.05
Potato soufflé	2.89	3.29	2.77
Salmon loaf	3.02	2.50	2.66
Sandwich	3.17	2.01	3.11
Lettuce leaf	3.21	1.68	2.93
Buttered spinach	3.25	2.36	2.58
Sandwich	3.48	2.10	3.15

The recorders were careful to note the foods refused or not finished. From five to twenty-one per cent of the rural children refused salmon loaf, lettuce, spinach, milk, cabbage salad, and liver loaf. In the nursery school homes, 19 foods were refused by five to twenty-one per cent of the children. These foods include, orange juice, milk, salmon, boiled potato, buttered spinach,

stewed tomato, lettuce, toast, wheatena, prunes, cabbage salad, sliced tomato, stewed apricots, baked spinach and egg, and peanut butter sandwich. There was a failure on the part of some of the children in both the nursery school homes and rural homes to finish every food in the menu.

Forty per cent or more of the rural children did not finish milk, salmon loaf, buttered spinach, toast, sandwich, potato souffle, lettuce, sliced tomato, shredded wheat, and stewed tomato. In the nursery school homes, boiled potato, lettuce, toast, sandwich, cabbage salad and sliced tomato were not finished by forty per cent or more of the children.

TABLE 3

Comparison of finishing ranks for suppers

FOODS SERVED	AVERAGE FINISHING RANKS	
	Rural	Nursery school home
Cream of pea soup	1.47	2.06
Milk	2.05	2
Carrot sticks	2.13	2
Scrambled egg	2.30	2
Carrot sticks	2.40	2.31
Sandwiches	2.52	2.19
Peanut butter sandwich	2.67	2.74
Milk	2.90	2.9
Toast	2.90	2.21
Baked spinach and egg	3.20	2.68
Milk	3.87	2.89

Adjusting the amount of food to the needs of the child and the policy of the clean plate reduced "refusals" and "failure to finish" to a minimum in the nursery school meals. It appears, however, that this training did not transfer to the home situations. The data show somewhat fewer refusals in the nursery school homes than in the rural homes. There is very little difference between the two groups in the percentage not finishing the foods.

TABLE 4

Combined average finishing ranks

FOOD	AVERAGE RANK	CLASS RANK
Soup:		
Cream of pea	1.76	1.76
Fruits:		
Orange juice	1.84	
Prunes	2.17	
Apricots	2.63	2.21
Cereals:		
Oatmeal	2.26	
Shredded wheat	2.50	
Wheatena	2.57	2.44
Raw vegetables:		
Sliced tomato	2.17	
Carrot sticks	2.21	
Lettuce	2.60	
Cabbage salad	2.89	2.46
Eggs:		
Scrambled	2.15	
Baked spinach and egg	2.94	2.54
Meats:		
Meat loaf	2.24	
Salmon loaf	2.72	
Liver loaf	2.73	2.56
Tomatoes:		
Sliced	2.56	
Scalloped	2.57	
Stewed	2.64	2.59
Potatoes:		
Baked	2.59	
Boiled	2.87	
Soufflé	2.98	2.81
Sandwiches		2.83
Milk		2.95
Buttered vegetables:		
Buttered spinach	2.36	
Buttered carrots	2.58	2.97
Toast		3.00

Table 4 gives the classification of foods according to kind, the class aver-

age rank being shown in columns 3, 6, and 9 respectively. Soup, fruit, cereals and raw vegetables are the most preferred foods while toast and buttered vegetables are the least preferred foods as shown by the table. Orange juice is the preferred fruit; sliced tomatoes, the most preferred of the raw vegetables; and oatmeal is the preferred cereal.

A comparison of the 2 groups on the basis of the time for eating the meal shows very little difference. For the breakfasts, the average time for the children in rural homes was 24.32 minutes and for the nursery school homes, 22.33 minutes; for dinners the average time in the rural situation was 25.77 and in the nursery school homes. 25.91 minutes; while for suppers, the mean time for the rural group was 23.90 minutes and for the nursery school group 22.18 minutes. These differences are too small to be significant.

There was a little more variation in the time for eating in the nursery school homes. For breakfast, the range was 30 minutes for the rural group and 38 minutes for the nursery school homes; for dinner the range for the former was 22 seconds, for the latter, 42 seconds; while for the supper, the range for the rural group was 25 seconds as compared with 28 seconds for the nursery school children. The absolute range for all the children for all the meals was 50 minutes; both extremes were found in the nursery school group. In one case the breakfast was eaten in 7 minutes while in another case it took 57 minutes to finish the dinner.

A summary of the reactions of the children to the thirty-four foods listed in the record form of Food Reactions shows that the foods which were liked by both groups include butter, both white and brown bread, milk, custard, carrots, peas, and beans. Less commonly served vegetables such as brussel sprouts, squash, turnips, and cauliflower were generally disliked by both groups. The greatest differences between the two groups occurred with spinach, asparagus, and apricots; the city children liked all of these better than the rural children liked them.

Some children in each group had never been offered some of the foods in the list. These foods were brussel sprouts, squash, asparagus, pancakes, turnips, cauliflower, pie, celery, onions and prepared cereals. To this list must be added spinach and apricots for the rural children and cake, rice, cabbage, custard and beets for the nursery school children. The data show that, where these foods were offered, brussel sprouts, squash, asparagus, spinach, have a low preference rank with the rural group and turnips and brussel sprouts, a low rank with the nursery school group. When offered, celery, onions and prepared cereals ranked high in percentages of likes in the rural group and apricots, prepared cereals, cabbage, beets and custard ranked high in the nursery school group.

On the whole, the children of the rural group appear to have better appetites than the children of the nursery school group. Forty per cent of the rural group are reported by their mothers as always hungry at meal time compared with 6.25 per cent of the nursery school children; 60 per cent of the rural children are

reported as usually hungry compared with 75 per cent of the nursery school children; while 18.75 per cent of the nursery school children are reported as never hungry at meal time.

Findings

Within the limits of these data the following conclusions may be drawn.

1. Children tend to finish foods on the plate in the order in which they taste them.

2. The children in the rural homes showed in general the same order of preference in the breakfast and supper menus as did the children in the nursery school homes.

3. A marked negative correlation between the nursery school homes and rural homes and a low correlation between nursery school and nursery school homes indicate that experience at the nursery school makes a change in the reactions of children to foods commonly served at the nursery school. Preferences tend to be less marked and in some instances the order of preference actually may be changed.

4. There were slightly more refusals of foods served in the homes by the rural children than by the nursery school children.

5. The percentage of children failing to finish foods on the plate was the same in each group.

6. There were no refusals of foods served at the nursery school.

7. When the foods served were classified, the order of preference as determined by average rank is as follows, soup, fruits, cereals, raw vegetables, eggs, meats, tomatoes, potatoes, milk, butter, vegetables and toast.

8. Several foods are served frequently at the nursery school which seldom if ever appears on the tables at home.

9. The differences in the time that it took the children of each group to eat the meal were very slight. The nursery school group had a very slight advantage over the rural group.

10. There was a greater percentage of negative reaction to the foods less commonly served.

11. Rural children had somewhat better appetites than the nursery school children.

REFERENCES

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Language of the Preschool Child

ELIZABETH STALNAKER

THIS study of language was made during the summer sessions 1931 and 1932 in the pre-school laboratory of West Virginia University.

Nine children were the subjects in 1931, and 5 in 1932, making a total of 14. Their ages ranged from two years four months to four years. The fathers of 8 of the children were professors in the University, 3 fathers were business men, 1 was a physician, 1 a musician, 1 a journalist. The study was made during the third week of the six-weeks' session, thus giving the children time to make adjustment to the new situation.

For 5 days each child was observed for a period of one and one-half hours by an observer, who recorded the entire conversation of the child, making note of the circumstances under which it occurred. The records accumulated by this method were then studied and the results tabulated as shown in the tables which follow.

The first step in the study was to classify the language of the child into the different parts of speech used; and also the contractions used. Table 1 shows the results. It is to be seen that more verbs, 30.05 per cent, are used than any other part of speech; next in order of magnitude are nouns, 21.4 per cent; pronouns, 12.46 per cent; articles and adjectives, 10.54 per cent; adverbs, 7.98 per cent; interjections, 5.10 per cent; prepositions, 4.99 per cent; and, conjunctions, 1.3 per cent. The earlier studies gave a somewhat different ranking. For example, Tracy (4) classified the parts of speech used in terms of percentage as follows: nouns, 60 per cent; verbs, 20 per cent; adjectives, 9 per cent; adverbs, 5 per cent; pronouns, 2 per cent; prepositions, 2 per cent; interjections, 1.7 per cent; and, conjunctions, .3 per cent. More recent studies show many noun forms are used but with a verbal meaning. In our classification great care was taken to classify the word according to the meaning implied rather than just the form. Since there is no uniformity in tabulating the verbs by the several investigators it may be well to state that in this study each different form of a verb was counted; for example, go, going and goes were counted as three instead of one.

Thirty-five different contractions were used, but the total number of times they were used was 148. Twelve of the contractions or 34.28 per cent were the contraction of the verb with the negative not; 14 or 40 per cent were contractions involving the personal pronouns; the remaining 9 or 25.71 per cent included the verb "is."

Table 2 gives the percentages of the different parts of speech used by the different age groups.

TABLE 1

Percentages of different parts of speech and contractions used

SUBJECT	AGE	VERBS	NOUNS	PRONOUNS	ARTICLES, ADJECTIVES	ADVERBS	PREPOSITIONS	INTERJECTIONS	CONJUNCTIONS	CONTRACTIONS
	yrs. mos.									
S. H.	4	33.03	23.69	6.60	15.41	9.25	4.84	3.52	1.32	5.72
Bill S.	3 10	37.66	18.18	9.09	9.74	11.03	4.54	1.94	1.94	5.84
J. P.	3 10	29.62	20.98	10.49	12.96	9.87	4.93	3.08	1.85	6.17
P. B.	3 8	29.48	26.06	7.26	9.40	11.11	4.27	2.99	1.28	8.11
E. G.	3 7	31.19	22.47	8.25	10.55	13.76	4.63	2.29	.91	6.42
Bob S.	3 6	31.97	10.66	25.92	9.25	5.55	7.40	1.85	3.70	3.70
S. M. S.	3 4	30.76	28.84	6.92	11.15	8.84	2.69	1.92	1.92	6.92
C. W.	3 3	30.66	21.33	9.33	8.00	10.66	6.66	4.00	1.33	8.00
M. M.	3 2	35.26	12.63	22.10	10.00	2.13	6.84	5.26	.52	5.26
M. A. R.	3 1	26.38	18.51	18.14	7.87	5.88	8.33	3.33	2.31	9.25
J. S.	2 11	30.50	15.81	19.52	10.17	4.22	5.68	6.21	1.13	6.78
E. H.	2 6	13.74	26.02	17.80	12.32		2.73	26.02		1.37
Bud S.	2 4	31.45	24.19	7.25	7.25	13.70	3.22	3.22		7.25
B. G.	2 4	29.03	30.32	5.80	13.54	5.80	3.22	5.80		6.45
Average		30.05	21.40	12.46	10.54	7.98	4.99	5.10	1.30	6.23

TABLE 2

Percentage of different parts of speech and contractions used by different age groups

NUMBER OF CASES	AGES BETWEEN	VERBS	NOUNS	PRONOUNS	ARTICLES, ADJECTIVES	ADVERBS	PREPOSITIONS	INTERJECTIONS	CONJUNCTIONS	CONTRACTIONS
	yrs. mos.									
1	4 6 / 4 0	33.03	23.69	6.60	15.41	9.25	4.84	3.52	1.32	5.72
5	3 11 / 3 6	31.98	19.67	12.20	10.38	10.26	5.15	2.43	1.94	6.06
4	3 5 / 3 0	30.77	20.33	14.12	9.26	6.88	6.13	3.63	1.52	7.36
2	2 11 / 2 6	22.12	20.92	18.66	11.25	2.11	4.21	16.12	.57	4.08
2	2 5 / 2 0	30.24	27.26	6.53	10.40	9.75	3.22	4.51		6.85

At all ages verbs lead, nouns come second, and pronouns come third, except in the case of the 1 four year old child and the 2 youngest two-year

olds, where articles or adjectives and adverbs take precedence over pronouns.

Smith (3) reports that at two years verbs, nouns and adverbs were the parts of speech most used. With our two-year group more adjectives are used than adverbs, and with the two and one-half year group pronouns hold third place. Smith further reports that at three, four and five years verbs and pronouns are the parts of speech most used. When we group under pronouns contractions including pronouns, our results would correspond with hers at these ages; otherwise the order remains as above stated—first, verbs; second, nouns; third, pronouns. However, when we consider the number of times each part of speech is used we find that pronouns and verbs change places.

In order to find out the words most frequently used the lists were scrutinized still further and only those words selected which had been used ten times or more.

This gave a total of 44 words used more than ten times. Restricting the list still more, we selected those words from it which were used by at least three children and we have the following list:

I, it, me, you, is, want, don't, going, get, the, a, my, here, to, in, car,—a total of sixteen words.

This list of most frequently used words included six of the ten listed by Smith. Our list does not include *this* or *that*. Smith's list is: I, it, is, you, do, a, not, the, that, this. In addition our list includes me, my, want, going, get, car, here, to, in, and the contraction don't, in place of do and not.

THE TYPE OF SENTENCE

The kind of sentences used by this group of children, and the number of words per sentence, was next studied. Table 3 contains the results.

The declarative sentence takes the lead at all ages, being especially marked in the younger ages. The next most frequent form is the sentence of request or command. We find only three exceptions. In their cases the interrogative sentence has second place. An analysis of those cases reveals the fact that many of their questions are mainly to secure the attention of the adults. Three of the four two-year olds used neither compound nor complex sentences; 7 children use compound sentences, but the percentage is small; and 3 of the children use complex sentences.

A few of the sentences were one word sentences and were employed by the younger children, such as "car" —meaning "I want the car" or "It is my car." More frequently, however, even the two year olds would use at least two words, such as "my car."

Johnson (1) states "after the age of two years, four months, there is a marked increase in the number of complete sentences used and in the correctness of these sentences as judged by grammatical standards." The fact that our 2 younger children were two years and four months of age probably accounts for the relatively few one word sentences used.

Table 4 gives the percentage of different types of sentences for the different age groups, together with the average number of words per sentence.

When we compare the average num-

TABLE 3

Percentage of different types of sentences used; and average number of words per sentence

SUBJECT	AGE	SIMPLE DECLARATIVE	REQUEST OR COMMAND	INTERROGATIVE	COMPLEX	COMPOUND	AVERAGE NUMBER OF WORDS PER SENTENCE
	yrs. mos.						
S. H.	4	63.70	15.32	19.35		1.61	6.37
Bill S.	3 10	50.96	34.61	9.61	1.92	2.88	5.11
J. P.	3 10	70.00	23.50	6.50			4.37
P. B.	3 8	64.31	21.14	11.89	1.76	.88	5.87
E. G.	3 7	66.05	4.58	29.35			6.39
Bob S.	3 6	63.64	9.09		27.27		8.40
S. M. S.	3 4	53.00	24.73	18.00	3.18	1.06	3.73
C. W.	3 3	73.00	24.30			2.70	3.73
Mc. M.	3 2	42.62	42.63	14.75			3.30
M. A. R.	3 1	61.70	14.80	17.20		6.30	5.10
J. S.	2 11	70.83	18.75	6.25		4.17	4.00
E. H.	2 6	86.06	11.62	2.32			2.60
Bud S.	2 4	70.80	22.12	7.08			3.68
Bill G.	2 4	92.65	3.64	3.64			2.83
Average		66.38	19.28	10.42	2.44	1.40	4.67

TABLE 4

Percentage of different types of sentences; and average number of words per sentence used by different age groups

NUMBER OF CASES	AGES BETWEEN	SIMPLE DECLARATIVE	REQUEST OR COMMAND	INTERROGATIVE	COMPLEX	COMPOUND	AVERAGE NUMBER OF WORDS PER SENTENCE
	yrs. mos.						
1	4 6 / 4 0	63.70	15.32	19.35		1.61	6.37
5	3 11 / 3 6	62.99	18.58	11.47	6.19	.75	6.03
4	3 5 / 3 0	57.58	26.62	12.49	.80	2.52	3.97
2	2 11 / 2 6	78.45	15.19	9.29		2.09	3.30
2	2 5 / 2 0	81.73	12.88	5.36			3.26

ber of words per sentence used by this group with Smith's table we find that our group uniformly uses longer sentences than do hers.

Average number of words used per sentence

	4 YEARS	3 YEARS 6 MONTHS	3 YEARS	2 YEARS 6 MONTHS	2 YEARS
W. V. U.....	6.37	6.03	3.97	3.30	3.26
Smith.....	4.3	4	3.3	2.4	1.7

The following are a few random samples of the different types of sentences used:

Declarative

"I'm going to make a train, too. Here comes my train. You had better watch out." (3 years 10 months.)

"Maybe a fishing worm will come out of that hole." (3 years 7 months.)

"I'd like to make something with a screwdriver." (3 years 3 months.)

"I want you det my tar. I tant det it." (2 years 4 months.)

"I want a stick. I got stick. I want blocks. Build house. Mine house. 'At's mine." (2 years 4 months.)

Command or request

"Get out the way, we're coming." (4 years.)

"There goes a spider—get it—get it. Put the snail back in. See if you can find me a fishing worm." (3 years 10 months.)

"Look at that little fly here on the table." (3 years 7 months.)

"Billy, don't take my clay; that's my clay." (3 years 3 months.)

"Let me alone me. Let me have car. Let me have it." (2 years 4 months.)

The two younger children used fewer sentences of this type. Their actions spoke louder than their words,—when they wanted some plaything their tendency was to go after it.

Interrogative

"Whose ball is this? Funny, wasn't it? When do we take our rest?"

"Traded, didn't we? Do you suppose they'd be in here?" (3 years 10 months.)

"Where is a fishing worm? Maybe I can find one?" (3 years 7 months.)

"Where's the handle to this? Do you like your daddy? I like my daddy." (3 years 4 months.)

"Where's my spade? 'Donna' dit more sand?" (2 years 4 months.)

Although interrogative in form, few of the questions are true questions in the sense of requesting information. They are used rather to confirm their own statements, or they are answered by themselves. One day one little girl asked: "When is my mamma coming?" She had asked the same question many times before, so the adult in charge was ignoring her. A few minutes later a little boy asked the same question, whereupon the little girl in question turned to him and answered in the most matter of fact way: "After you take your rest, and eat your dinner and have your nap;" thus showing that she had all the information, and that her question was merely for the purpose of getting the attention of the adult. Many of the questions of the older children are solely for the purpose of establishing social contacts.

Complex and compound sentences

"You can get some with your own shovel if you want some."

"Charles, go show the little boy where another car is, will you? Do you want to show the little boy where a car is?"

"When I get done going up the ladder and down the sliding board, will you give it to me?"

"I have a clean suit on and I don't want to get it dirty."

"You better hurry and pound them in, so I can pound them in."

A great many repetitions were noticed, repetitions of a single word, of a phrase, of an entire sentence, or a single idea. For example:

"Where? Where? Where?"

"Come here Susan, come here Susan, Susan, Suz."

"Run it back to me, to me, to me."

"I got it first; I got it first; I got it first."

"Want any more? Want any more?"

"Dr. Armstrong's house is burned. That whistle was a fire whistle. The whistle was Dr. Armstrong's house. Dr. Armstrong's house is burned. Dr. Armstrong's house is burned. Did you hear the fire whistle? That was Dr. Armstrong's house. His house is burned. That was the whistle. Did you hear the fire whistle? Dr. Armstrong's fire whistle. Dr. Armstrong's fire whistle. Dr. Armstrong's fire whistle."

Often the repetitions were sung or chanted.

There was very little baby talk. The forms most used were: 'at for that; 'for for before; 'cause for because; 'most for almost; 'em for them; tan for can; tan't for can't; tum and tuming for come and coming; fank you for thank you; bof for both; free for three; dit for get; donna for going to; wong sing for wrong thing; butit for bucket.

There was a rather consistent substitution of t for c; of f for th; and d for g. The other irregularities were more individual.

The following sentences contain some of the most outstanding incorrect forms:

"No one can't get me."

"He ain't over here to pound."

"I seed the sparklers (of fireworks)."

"Try to get a stone to throw at them old flies."

"Me and Lucy Ann are both three years old."

"I don't have some."

Piaget (4), who has devoted much study to this subject, says the talk of children may be divided into two large groups—the egocentric and the socialized. Says Piaget: "When a child utters phrases belonging to the first group, he does not bother to know to whom he is speaking or whether he is being listened to. He talks either for himself or for the pleasure of associating anyone who happens to be there with the activity of the moment. Anyone will serve as an audience. He feels no desire to influence his hearer nor to tell him anything." The egocentric speech he further divides into three categories. 1. *Repetition*—repetition of words or syllables. These the child repeats for the pleasure of talking. Often the words have no meaning. 2. *Monologue*—In this case the child talks to himself, as though he were thinking. We have abundant examples of these two forms—For example, "No, no,—I go right, I go right." (2 years 4 months.) 3. *Dual or collective monologue*—In this case another person is present, but is expected neither to attend nor to understand. It is his presence which is the important thing and acts as a stimulus. Illustrative of this is the following: "This is a big tower, see my big tower, big tower. See-saw; see-saw." (3 years 3 months.) Although this speech might indicate the child wished to communicate with the adult present, the refrain into which the conversation drops shows she is clearly interested in self-expression alone.

It is much the same as the following speech which is directed chiefly to a fishing worm. "That's one for me; go on in there; there you go; I'll cover

you up" (all said to the fishing worm). (3 years 3 months.)

In socialized speech five forms are distinguished; (1) *Adapted information*—this form takes place when the child adapts the point of view of a hearer who is not chosen at random. He wishes to tell his hearer something or to influence him. Now the child talks about something other than himself—for example:

"Look at that bug. Oh dump him, kill the bug. Now it's killed. It is not killed." (3 years 10 months).

"Claire, you're getting your hands dirty." (3 years 4 months.)

"That whistle was a fire whistle." (3 years 10 months.)

"You have one and I have one" (referring to Kiddy car). (3 years 4 months.)

(2) *Criticism* includes all the remarks made about the work or the behavior of others. It is an assertion of superiority of self and a depreciation of others. This form of expression is relatively rare. We found only a few such remarks among the children. The following are illustrative:

"That's too big, Charles" (referring to a sand pile). (4 years.)

"I can't get this out" (a peg). "In too hard." (3 years 7 months.)

The three remaining forms of socialized speech, according to Piaget are commands, requests and threats, questions, and answers. Examples of each of these have been given already.

A study of the language of this group of children seems to bear out the statement of Piaget that the younger the child the more egocentric he is. The younger the child the more repetitions, and the greater amount of monologue used. Dual monologue seems to be a sort of transitional stage, for while the younger ones were using it somewhat, the older ones were using it less and less. The younger group showed no signs of adaptive information or criticism; their commands were chiefly of the "want, get, or give me" variety and their questions and answers were few indeed. With the older group there was more adaptive information and there were more requests or commands and more questions, but very little criticism.

CONCLUSIONS

1. There are more verbs used than any other part of speech by children of pre-school age.

2. There are more contractions of verbs and personal pronouns than with any other parts of speech, although the contraction of the verb and the negative *not* is more frequently used.

3. The parts of speech most frequently used at 3 and 4 years are verbs and pronouns, when the pronoun contractions are listed with pronouns.

4. The words most frequently used are I, it, me, you, is, want, don't, going, get, the, a, my, here, to, in, car.

5. The order of frequency of sentence structure is (1) declarative (2) imperative (3) interrogative.

6. Complex and compound sentences are very few, and when combined, constitute less than 2 per cent.

7. The length of the sentence increases with age.

8. Many repetitions are noted, but comparatively little "baby talk" and few incorrect forms of speech are used.

9. The younger the child the more egocentric he is, as is shown by his language. Children under three years

give little evidence of socialized language behavior, their conversation conforming, in the main, to the egocentric type.

10. Children between three and four are emerging from the egocentric stage using it chiefly for emphasis, and are entering a new socialized phase of development as shown by their language. They have not yet developed to the stage of criticism or the stage of true questioning in any marked degree.

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Friendships and Quarrels Among Preschool Children

ELISE HART GREEN[1]

THIS study had a three-fold purpose: first, to determine the relative rôles of group play and quarreling in the socialization of the preschool child; second, to study age and sex differences in social contacts and in quarrels; and third, to analyze the types of social play in which quarrels arise.

THE LITERATURE

Most students of children's friendships have sought the basis for comradliness in similarities of age, sex, size, maturity, intelligence, and personality traits of the individuals making up the pair rather than in actual observation of the social intercourse of the pair. Thus Almack (1), from a query of 387 school children as to the child each would prefer as a working companion and the child he would invite to a party, concluded that M.A. is a more important factor than C.A. or I.Q. in the formation of friendships. Wellman (17), studying 27 pairs of girls and 29 pairs of boys in the seventh, eighth, and ninth grades found girl pairs more alike in scholarship, physical achievement, and extraversion, and boy pairs more alike in height, I.Q. and C.A. Furfey (7) obtained moderate correlations between C.A., developmental age, M.A. and weight for 35 pairs of friendly boys; but he concluded that non-intellectual factors such as common moral standards, tastes, and temperament were more important factors than the traits he had measured in the formation of friendships.

At the preschool level Chevaleva-Janovskaja (6) found more bisexual than unisexual groups. Challman (5) discovered that children formed friendships with those of their own sex and that for boys strength of friendship increased with age. Likeness in age, physical activity, and sociability apparently influenced the early friendships of boys to a somewhat greater extent than those of girls. Similarity in M.A., height, extraversion, attractiveness of personality as rated by adults, and laughter seemed to play no part in the friendships of either sex.

Parten (13) found that social participation and leadership among nursery school children increased with age.

[1] From the Institute of Child Welfare, The University of Minnesota. I wish to express grateful appreciation to Dr. Mary Shirley for guidance throughout the course of the study, and to Dr. John E. Anderson for many valuable suggestions. I also wish to thank the nursery school teachers and the graduate assistants for their coöperation, particularly Miss Marjorie Page who made the simultaneous observations.

Play groups were usually unisexual. Doll play elicited the greatest amount of social coöperation and play with trains the least. Bühler (3), using 114 babies under one year describes the dominating, the humanitarian, and the exhibiting or producing traits of personality appearing at this early age. Mengert (12) observed the reactions of every possible pair of 10 two-year-olds; he then computed a friendliness score for each child. Because of the small number of cases the correlations that he obtained between friendliness and I.Q., M.A., and C.A. are not very dependable.

Goodenough's (8) study of anger in young children is the only one that has much bearing on the topic of quarrels. Her discovery of a decrease of undirected energy, an increase of retaliative behavior with age, and the greater frequency of outburst for boys are of particular interest to the present study.

No direct studies on the relation of unfriendly to friendly contacts among preschool children have been made. Challman in his study of friendship, makes the assumption that "antipathies, if present, are expressed by friendship indices of low magnitude" (5, p. 152). The question arises as to whether social relations vary in a continuous scale from friendship through the zero point of indifference to the opposite pole of antipathy, or whether antipathy lies above indifference on the scale. It is probable that quarreling is an essential part of friendly social intercourse. If this were true then a low friendship index would indicate indifference rather than antipathy. The problem of the relationship between friendship and quarreling is an interesting one, theoretically, and one that can well be studied at the preschool level. The children of this age are less likely than older children or adults to conceal their true feelings towards one another.

METHOD

Subjects

The subjects were 40 children attending the nursery school at the Institute of Child Welfare, University of Minnesota. There were 21 boys and 19 girls, ranging in age from 2 years 1 month to 5 years. The distribution according to age and sex are given in table 1. The average age of the boys was 40.9 months, and that of the girls 45 months. The I.Q.'s

TABLE 1

Indices according to age and sex

AGE RANGE	NUMBER OF CASES	F.I.	Q.I.	$\frac{Q}{F}$
54–65	9	4.74	.424	8.93
42–53	14	3.95	.627	15.88
30–41	12	2.81	.672	23.85
18–29	5	2.12	.605	28.45
All	40	3.5	.602	17.03
Boys				
54–65	4	5.43	.56	10.3
42–53	6	3.81	.81	21.2
30–41	7	2.62	.72	26.7
18–29	4	2.08	.60	29
All boys	21	3.52	.69	19.6
Girls				
54–65	5	4.46	.34	7.55
42–53	8	3.52	.49	14
30–41	5	3.06	.63	20.6
18–29	1	2.42	.61	25
All girls	19	3.54	.507	14.32

of the children in the group ranged from 90 to 131, with a mean of 107.7.

Record blank. The time sampling technique was used in this study. Preliminary 1-minute observations were made on several children during the morning free-play periods for a week. This survey indicated that a 30 second interval was long enough for obtaining the desired information on the children's social contacts and their quarrels; this shortening of the observation interval made it possible to obtain more observations. From notes taken in this preliminary study a record form was devised. This form was then tried out, and as a result various changes were made. A sample of the final record form as filled in during an observation is shown in Form A.

FORM A

Name OLIVE

Date 1/18/32 Day Monday Hour: 9:30–10:30 Weather I-BC Observer E.G.

1) Activity	2) Solitary	3) Companions	4) Antagonism			5) Aggressor	6) Object
			a) Verbal	b) Physical	c) Spatial	a) Passive	b) Retaliative
Drawing	P6, P26, P30		x	x		x	x

7) Children Absent 3, 11, 16, 21, 22, 27

Space was provided for recording the activity in which the child was engaged, who his companions were, and if antagonism arose whether it was expressed verbally, by argument or calling names, by physical force, such as kicking, pulling, or biting, or spatially by putting out the tongue and making faces. The name of the child who was aggressor, whether the child under observation played a passive or a retaliative rôle, and the Parten categories of solitary, parallel, and coöperative play were also noted.

Procedure in record taking. These records were taken during the free play periods in the morning from 9:30 to 10:30, and in the afternoon from 3:15 to 3:45. In warm weather the children were outside on a large playground. In cold weather they played inside the nursery school. Teachers were present, but they did not interfere with the children unless there was danger of physical injury or unfairness to some child.

Each child's record was kept on a separate blank and each day the order in which the children were to be observed was prearranged simply by stacking the pages in the proper order. The order was varied from day to day. This guarded against errors that might have arisen if a given child had always been observed early or late in the play period. This procedure also prevented the observer from being attracted to a child by a striking incident or quarrel, a thing that would have invalidated the results.

The observer sought out the child whose blank was on the top of the stack, made a 30-second observation

on him, and then hunted up the child whose page was second, and so on. This procedure was followed until the end of the free play period.

No child was observed more than once a day. If a teacher interfered with any child who was being observed, that record was discarded, and the child's sheet placed at the bottom of the pile. The observation was then made later.

Consistency of record taking. In order to check the consistency of the recording, a second observer P made a complete set of observations with the author. The two took records simultaneously but independently both starting together at a given signal. In 85 per cent of the items the two observers agree perfectly. P omitted 7.5 per cent of the items included by G, and added 8.4 per cent items. In 7.5 per cent of the items they disagreed. These disagreements consisted of slight variations in the type of activity, or in the type of antagonistic behavior. There were no discrepancies in the number or names of the children involved or in those reported absent. Since a percentage agreement of 85 is equivalent to a correlation of .92, the objectivity of the recording is remarkably high.

Method of treating the observations. Forty 30-second observations were made on 31 of the children. It was possible to get only from 18 to 34 observations on the other nine, due to the fact that 5 children graduated from the nursery school in February, and were replaced by 4 new children. In working up the data, the number of observations were pro-rated on the basis of forty so that the discrepancies do not affect the results.

The study yields two types of data: the nature of the social interaction between pairs of individual children; and the characteristics of preschool play groups.

Social interaction scores. The interaction scores are represented by indices somewhat similar to those worked out by Challman. These were obtained by first recording on a large master sheet the number of opportunities each child had to play with every other child, the number of times he did play with each, and the number of times he quarreled with each. In making these tabulations parallel play was disregarded and coöperative play only was used as the criterion for companionship.

Three types of indices were computed. The friendship indices were obtained by getting the ratio of the number of times the child played with another child to the number of opportunities he had to play with that particular child, i.e., the number of times they were both present. Similarly quarrelsomeness indices were obtained by dividing the number of quarrels by the number of the opportunities for playing together. A third ratio was worked out by dividing the number of quarrels by the number of times the two children played together. This is referred to as the quarrelsomeness-friendliness ratio. The three indices are abbreviated in the tables as F.I., Q.I., and Q/F.

At this point it may be well to justify the method of basing the friendship indices on all the social contacts. The number of quarrelsome

contacts might have been subtracted from the total number in order to obtain the number of friendly contacts. This method was not used, however, because of the observer's impression that some friendliness was present in every contact. The children played amicably at least part of the time; disagreements if any occurred did not last for the whole 30-second period. This impression was substantiated by the work of Dawe[2] who in a study of 200 quarrels, found that the median length of quarrels was 14 seconds.

Reliability. The frequency of group play for each child was totalled for the first 20 and second 20 observations separately, and the rank order correlation of these frequencies was .81 ±.04; raised by the Spearman-Brown formula this correlation became .895.

Correlations were also computed between each of the indices as obtained from direct observations and the corresponding indices obtained from the incidental observations. They were as follows: friendship indices .83; quarrelsomeness indices .57; and quarrelsomeness-friendliness ratios .63. When the Spearman-Brown formula is applied, they become .90, .72, .77 respectively.

The consistency of the data on group play and quarreling was further tested by working up the averages and percentages separately for the first 20 and the second 20 observations. This treatment of the two halves of the data corresponds somewhat to a repetition of the experiment. The tables showing these results are too long and detailed to be published. It suffices here to state that the agreement in figures for the two halves is great. The high consistency of these data, as indicated by the two methods of treatment, proves that this method of observation is a reliable one for the study of these social phenomena.

[2] Dawe, Helen. "An Analysis of Children's Quarrels." M. A. thesis, University of Minnesota, 1932.

SOCIAL INTERACTION

Throughout this study, when average indices are quoted, they were computed by totalling separately the number of opportunities for contact, the number of contacts, and the number of quarrels for each individual pair of children in the group considered, and then working out the particular indices from these totals. Thus the indices were never averaged directly. The average indices for the whole group, as shown in table 1, are F.I., 3.5; Q.I., .602; and Q/F 17.03.

Age differences in friendship indices. In table 1 are presented the average friendship indices for the four age groups. Results from both direct and incidental observations are included. The size of the friendship index increases regularly with age. The upper two age groups are above the average friendship index for the group as a whole, the lower two are below the average. The question arises as to whether this increase in the average friendship index is due to the fact that as they grow older children tend to play with more children, or that they tend to form closer friendships with a few particular children. In order to determine this the number of different

children played with by each child during the entire series of observations was computed, and also the number of friendship indices of fifteen or more obtained for each child. An index of 15 was chosen as indicating high friendship; this figure was more than 4 times the group average.

These data, summarized by age groups, are presented in table 2. It is apparent from the third column in this table that the average number of different children played with increases from two to three years of age, but that after this period there is little change except for a slight dropping off at the 5-year level. When the average frequency of high friendship indices are considered, however, the effect of age becomes more apparent. The number of strong friendships increases rapidly from the third to the fifth year level. It may be concluded then, that the increase in the size of friendship indices from 2 to 3 years is due to an increased number of playmates, but that after this age it is due more and more to an increasing in friendship for a few particular children.

TABLE 2

Average number of friendships and average number of strong friendships by age and sex

AGE RANGE	BOYS	GIRLS	ALL
Average number of different children played with in all friendships			
54–65	24.5	22.6	23.4
42–53	26	23.8	24.7
30–41	21.9	27	24
18–29	17.8	19	18
All ages	22.7	24	23.3
Average number of strong friendships (F.I.'s of 15 or higher)			
54–65	6	4.2	5
42–53	3.8	2.4	3
30–41	1	.8	.93
18–29	1.3	1	1.4
All ages	2.8	2.4	2.6

The relationship between number of different children played with and number of high friendship indices was studied by dividing the children into three approximately equal groups on the basis of the number of different children played with. The average number of high F.I's. for each of these three groups was computed. Those children who played with twenty-eight to thirty-four different children had an average of 2.9 good friends, those who played with twenty-two to twenty-seven different children had an average of 2.4 good friends and those who played with under 21 different children had an average of 2.5 good friends. These results show that there is little relationship between the number of different children played with, and the number of good friends. While strength of friendship is not sacrificed to number of friends, neither does a large number of friends insure strong friendships with a few children.

Quarrelsomeness indices and Q/F ratios. According to table 1, the highest quarrelsomeness indices are found at the 3-year level. These decrease slightly from 3 to 4 years of age, and show a decided drop at the 5-year level; this is the only age group that is below the average quarrelsomeness index for the group as a whole. Except for the 2-year level these indices decrease with age, but this exception is probably due to the

fact that the youngest children seldom play with other children and thus have less chance to quarrel.

This fact is more clearly brought out by the Q/F ratio. This ratio indicates, in some measure, the socialization of the child, for it shows the number of times he quarrels in relation to the number of times he plays with other children. Thus a low Q/F index would indicate that the child is well enough advanced in his social development to play with other children amicably. That this ability develops with age is clearly shown by the steady decrease in the Q/F ratio as the child grows older.

In comparing the relative influence of the number of different children quarreled with, and the incidence of high quarrelsomeness indices, the same procedure was followed as in the case of the friendship indices. A quarrelsomeness index of 5 or over was considered as a criterion of strong antagonism between a pair of children. The data resulting from this treatment are found in table 3. A study of these data reveals that the number of different children quarreled with has considerably more influence on the quarrelsomeness index than has the frequency of high quarrelsomeness indices. The latter show practically no age differences, and no definite trend is noticeable.

When children were divided into 3 approximately equal groups according to number of children quarreled with, it was found that those who quarreled with eleven to eighteen different children had an average of 4.4 high quarrelsomeness indices; those who quarreled with six to ten different children had an average of 2 high quarrelsomeness indices, and those who quarreled with two to five different children had an average of 1.9 high quarrelsomeness indices. Evidently, then, number of different children quarreled with, and number of high Q.I's, are somewhat related; those children who quarrel with the most children also show the highest Q.I's.

TABLE 3

Average number of quarrels and average number of high quarrelsomeness indices by age and sex

Average number of different children quarreled with in all quarrelsomeness

AGE RANGE	BOYS	GIRLS	ALL
54–65	7	4.4	5.6
42–53	11.8	8.6	10
30–41	10.1	10	10.1
18–29	8	6	7.6
All ages	9.6	7.7	8.8

Average number of high quarrelsomeness indices (above 5)

AGE RANGE	NUMBER OF HIGH Q.I.'s	NUMBER OF HIGH Q.I.'s	NUMBER OF HIGH Q.I.'s
54–65	4	3.6	3.8
42–53	4	.75	2.1
30–41	2.7	2.8	2.7
18–29	3.3	2	3
All ages	3.4	2.1	2.8

That this relationship does not always hold, however, is shown by the fact that the 3-year-old group which quarrels with the largest number of different children, does not have the highest frequency of large Q.I's.

Sex differences in friendship indices. The sex differences in the average friendship index for all ages combined, as indicated in table 1, are small. In the 2 lower age groups the girls have a

higher average F.I. than the boys, whereas in the two upper groups, the average F.I.'s of the boys are higher. Further differences between the sexes appear when the number of different children played with, and the number of high F.I.'s are considered. (See table 2.) While girls play with an average of 24 different children, boys play with only 22.7 different children. Girls, on the other hand, show an average of 2.4 high F.I.'s, whereas boys have an average of 2.8 high F.I.'s. It would seem, then that girls form more friendships, but boys form deeper friendships.

It is a well known fact that girls are more advanced in physical development than boys at the same age, and that this difference beings to appear in early childhood. Studies of motor development and of speech show that girls begin to walk and talk earlier than boys. It is possible that girls likewise mature at an earlier age in their social relationships. One effect of age is that average number of different children played with increases up to four years, but drops off at the fifth year. From data for the two sexes in table 2 it is apparent that the girls reach their peak of heterogeneity of companionship at the third year level, and that they play with a smaller number of different children at the fourth year level, and a still smaller number at the fifth. Whether or not this trend for number of friends to diminish with age holds for older children could be discovered only by a similar study on older children. If it were found to hold, it would provide further substantiation for the law that development proceeds from the general to the specific, and it would also show that girls are more advanced than boys in the various stages of social development.

The number of high F.I.'s for the two sexes follows the trend for the group as a whole, but at every age boys show a greater number of deep friendships than do girls.

Quarrelsomeness indices and Q/F ratios. It is evident from table 1 that the average quarrelsomeness index for all the boys combined is considerably higher than that of all the girls. At every age except 2 years boys have a higher average Q.I. index than girls. This finding agrees with Dawe's conclusion that boys participate in more quarrels than girls do.

The highest average Q.I. index obtained by the girls is found at the 3-year level, and thereafter there is a steady decrease. The boys do not reach their high point until 4 years of age, but this too is followed by a decrease. The Q/F ratio indicates that girls at every age are better socialized than boys, a finding that further substantiates the hypothesis formulated above.

A consideration of table 3, leads to the conclusion that boys quarrel with more individual children, and that they also form a greater number of antipathies. This is apparent at practically every age level. Girls reach their peak in number of different children quarreled with at three years, and boys not until a year later.

INFLUENCE OF UNISEXUAL AND BISEXUAL COMPANIONSHIP ON FRIENDSHIP AND QUARRELING

For the purpose of finding the differences in unisexual and bisexual companionships, the group was sub-

divided into 4 sections: boys with boys, girls with girls, boys with girls, and girls with boys. Each of these were in turn divided into the 4 age groups. Averages of each of the friendship index for the 3-year-old boys with the 5-year-old boys as obtained by direct observation is 1.85, and as obtained by incidental observation is 1.87.

TABLE 4

Influence of unisexual and bisexual companionship on friendships and quarrelsomeness

AGE RANGE	54–65			42–53			30–41			18–29		
	F.I.	Q.I.	$\frac{Q}{F}$	F.I.	Q.I.	$\frac{Q}{F}$	F.I.	Q.I.	$\frac{Q}{F}$	F.I.	Q.I.	$\frac{Q}{F}$
Boys with boys												
54–65	17.3	1.23	6.9	5.85	.81	13.8	1.87	1.87	10	1.11	.37	33
42–53	6.02	1.09	18.2	9.95	1.51	15.2	5.7	.835	14.7	2.02	.55	27.2
30–41	1.85	.34	18.2	5.2	1.24	23.8	2.51	.78	31	1.12	.96	85.6
18–29	.97	0	0	2.38	.79	33.3	1.39	.42	30	.47	0	0
All ages	5.4	.615	11.4	6.15	1.08	17.6	3.16	.77	24.2	1.44	.51	35.4
All boys with all boys.....				4.15	.795	19.1						
Girls with girls												
54–65	12.3	1.05	8.5	5.9	0	0	1.33	.19	14.3	3.85	0	0
42–53	5.08	.24	4.7	5.9	.685	11.6	3.78	.16	4.25	3.36	.84	25
30–41	1.09	.18	16.7	2.11	.338	16	4.7	1.13	24.2	4.25	1.41	33.3
18–29	7.5	0	0	1.2	0	0	2.97	.99	33.3	0	0	0
All ages	5.57	.34	6.03	4.73	.412	8.7	3.04	.49	16.1	3.06	.575	18.7
All girls with all girls.....				4.37	.425	9.75						
Boys with girls												
54–65	6.8	.49	7.14	3.0	.57	19	3.8	0	0	3.6	0	0
42–53	1.5	0	0	2.5	.55	22.2	3.5	.84	23.6	1.1	0	0
30–41	1.21	0	0	1.49	.54	36	3.0	.81	27.3	1.9	.95	50
18–29	2.3	0	0	2.5	.68	27.3	2.6	1.2	43.7	1.8	0	0
All boys	4.2	.37	6.7	2.6	.52	20.0	2.5	.69	27.8	1.5	.69	27.7
All girls	2.6	.10	6.6	2.2	.58	26.0	3.2	.77	23.7	1.8	.36	20.0
Girls with boys												
54–65	9.2	.48	5.25	2.2	.36	16.7	2.4	.66	25.5	4.8	.96	20
42–53	4.6	.42	9.09	3.0	.46	15.4	1.8	.6	33.3	3	.71	23.8
30–41	2.9	.63	21.7	3.5	.61	17.3	2.6	.94	36	2.3	.64	27.27
18–29	2.3	0	0	2.4	.81	33.3	2.3	1.5	66.7	0	0	0
All girls	4.2	.59	13.8	2.8	.54	19.1	3.3	.73	25.2	2.0	.86	42.5
All boys	5.2	.48	9.25	2.9	.50	16.8	2.2	.76	34.7	3.1	.72	23.4
All boys and girls with all girls and boys.....							2.84	.575	20.2			

indices were worked for each subgroup. Results from direct and incidental observations were treated separately. Thus in table 4 the

Each of these sections will be treated separately in relation to the 3 indices, and then comparisons will be made.

Friendship Indices: Boys with boys.

The 5-year-old boys, as shown in table 4, play most frequently with boys of their own age. Their next most frequent companions are the 4-year-olds, then the 3-year-olds, and finally the 2-year-olds. This trend is clearly shown by indices from both the direct and the incidental results.

The 4-year-old boys also play most often with boys of their own age. Their second choice is the 5-year-olds, then the 3-year-olds, and finally the 2-year-olds. The indices from the direct and incidental results agree in this case as well.

The 3-year-old boys play with the 4-year-olds more than with their own age group; the latter is their second choice. Next come the 5-year-olds and finally the 2-year-olds. The fact that this age group plays more with boys just older than with boys of their own age is substantiated by the indices based on the incidental observations, and is probably the result of the inability of the younger children to find coöperative companionship in their own age group.

The 2-year-old boys also play most often with the 4-year-old boys. Then come the 3-year-olds as companions, then the 5-year-olds, and finally their own age group. This order probably occurs for the reason given above. At every age, the 2-year-olds are least sought as companions.

If the table is read diagonally from the lower right to the upper left hand corner, it may be observed that the boys play more frequently with their own age group as they grow older. This is, however, for the most part due to the fact that children in general become more social with increasing age.

The average friendship indices for each of the four age groups with boys of all ages, are also presented on this table. There is a steady increase in boys' play with boys from 2 to 4 years, followed by a slight decrease at the 5-year-level.

Girls with girls. The 5-year-old girls also play with their own age group more than with any other group. According to the indices based on the direct observation, their next most frequent companions are the 4-year-olds, and then the 2-year-olds. The indices based on the incidental observations, however, give second place to the 2-year-olds and third place to the 4-year-olds. This discrepancy is probably a result of there being only one girl in the 2-year-old group. The 5-year-old girls do show a preference for playing with the 2-year-old girls, probably because in their games of playing house, there is always need for a baby. In the indices from both direct and incidental observations, the 5-year-old girls play least often with the 3-year-olds.

The 4-year-old girls play most often with their own age group, then with the 5-year-olds, then with the 3-year-olds, and finally with the 2-year-olds. This follows the same order as that found for the 4-year-old boys.

The 3-year-old girls, according to the indices based on direct observation, play most frequently with girls of their own age, next with 2-year-old girls, then 4-year-olds and finally with 5-year-olds. This order is changed slightly when indices based on incidental observations are considered. Nevertheless, the fact that girls of 3 years find girls of their own age group most

companionable, whereas boys of 3 seek older boys as friends, again suggests the earlier socialization of girls.

Little emphasis can be placed on the companions of the 2-year-old girls, as there was only one child in the group. According to the indices based on direct observations, she played most frequently with the 5-year-olds, then with the 3-year-olds, and finally with the 4-year-olds. According to indices from incidental observations, she played most frequently with the 3-year-olds, then the 5-year-olds, and then the 4-year-olds.

By reading the table diagonally, it can be seen that as they grow older, girls play more and more frequently with their own age group. The average friendship indices for each of the four age groups with girls of all ages, are also presented. These increase quite regularly with age.

Boys with girls and girls with boys. These 2 tables will not be analyzed in detail, but will be used for the most part to make comparisons with the unisexual groups. However, one thing should be made clear. In the boys-girls table, the boys were observed directly, and thus their age groups are presented in the vertical column at the left. The observation of the girls was incidental and thus their age groups are presented horizontally at the top of the table. In order to find the average friendship index of the 3-year-old boys with the 2-year-old girls, it is necessary to find the 30–41 age group at the left of the table, and then to read across to the point where this line intersects the 18–29 age group. In this case the index is 1.9.

In the girls-boys table the opposite is true. In this case the girls were observed directly, and their age groups are presented at the left. The age groups of the boys are written at the top. The friendship index for the 4-year-old boys with the 3-year-old girls can be found by the procedure given above. This index is 1.8.

Both the 5-year-old girls and 5-year-old boys are more companionable with the opposite sex in their own age group than with the opposite sex in the younger groups. Their second preference is for 2-year-olds of the opposite sex. Indeed 5-year-old children play more often with 2-year-olds of the opposite sex than they do with 4-year-olds of the same sex. Finally both boys and girls of 5 years play more with members of the opposite sex of all ages than do the children at the younger ages. This greater friendliness of 5-year-old children is a function of their higher socialization. The 4-, 3-, and 2-year groups have low friendship indices for members of the opposite sex and these are about the same magnitude for all ages; the 2-year-olds are somewhat more allied to the 5-year-olds of the opposite sex than to those of any other age.

A more detailed analysis of table 4 shows that 5-year-old boys prefer the company of 5-year and 4-year-old boys to that of 5-year and 4-year-old girls, but when they play with the 3-year and 2-year-old groups, they prefer the girls as companions. The 4-year-old boys are more addicted to masculine companionship, since they prefer the boys to the girls at every age level except the youngest, where they show little choice. The 3-year-old boys are more friendly with boys than

with girls of the 5- and 4-year-old groups, but prefer the girls at their own age and at the 2-year level. The 2-year-old boys, however, prefer the company of girls at every age level, probably because the girls indulge in less strenuous activities, and are inclined to mother the younger children and include them in their games of house.

The 5-year-old girls are predominately interested in children of their own sex, although they also play considerably with boys of the two younger ages. The 4-year-old girls prefer the company of their own sex of every age except 2 years; here they are equally fond of the company of boys. The 3-year-old girls form deeper friendships with the 5-year-old boys, are equally friendly with the boys and girls of 4-years, and prefer girls at their own age and at 2 years. The single 2-year-old girl preferred the girls at all ages.

In general, unisexual friendships are stronger than bisexual friendships. The indices are to be found in the rows "all boys with all boys," "all girls with all girls" and "all boys and girls with all girls and boys." The F.I.'s for the unisexual groups are both higher than the average 3.5, while that of the bisexual group is below this average. Girls in general, form stronger unisexual friendships than the boys.

Quarrelsomeness indices and Q/F ratios. Comparison of the average Q.I.'s for the three different groups shows that the group consisting of the boys with boys quarrels the most frequently. The second largest frequency of quarrels comes in the bisexual group, and the least number of quarrels is found in the girls with girls group. It may be concluded then, that any group in which boys form a part, will have a higher frequency of quarrels than a group composed only of girls. As a general rule in the boys-boys group and the girls-girls group, the age groups that play together most frequently also quarrel together most frequently. This is particularly noticeable at the older ages. This suggests that quarreling is a part of friendly social relationships for children of these ages.

The Q/F ratios also show differences. The lowest average Q/F is found in the girls-girls group, the highest in the bisexual group. This indicates that in relation to the number of times they play together, children quarrel most frequently with other children of the opposite sex. The Q/F ratio combined for all ages for the boys-boys group and the girls-girls group decrease regularly with age. This trend is not as noticeable in the bisexual group.

Interrelations among the indices. The rank order correlation between the F.I. and Q.I. for each child (direct and incidental results combined) was .34. This moderate correlation between F.I. and Q.I. disproves Challman's assumption that a low F.I. indicates antipathy. There is a slight tendency for those who play together also to quarrel together, and this would seem to indicate that quarreling is a part of friendship rather than its antithesis.

When F.I.'s and Q/F's were compared, a correlation of $-.57$ resulted.

This negative correlation indicates that a child with a high F.I. is well socialized; he gets along amicably with a large number of friends. A comparison of Q.I. and Q/F yields a correlation of .50, which means, in general, that children who quarrel most often are less socialized.

Mutual pairs. For the purpose of further clarifying the relation between friendship and quarrelsomeness, four sets of mutual pairs of children were obtained. The first set consisted of ten pairs of mutual friends; each member of the pair had an F.I. of more than 18 for his partner. The second set consisted of ten pairs of children of low mutual friendship; each pair had F.I.'s below 3.5. The third set of ten were mutual quarrelers; each had Q.I.'s above 3. The fourth set included 111 pairs of children who showed some friendliness for each other but who never quarreled with each other. The F.I.'s, Q.I.'s and Q/F's were worked out for each pair in each group by combining results from direct and incidental observation. The average F.I., Q.I., and Q/F's were also obtained for each set. These data are presented in table 5.

TABLE 5

Average indices and ratios for mutual pairs of children

	NUMBER OF PAIRS	F.I.	Q.I.	Q/F
High Mutual F.I.'s (above 18)	10	32.2	2.42	7.5
Low Mutual F.I.'s (below 3.5)	10	2.86	.855	.30
High Q.I.'s (above 3.0)	10	10.85	4.71	43.5
Non-quarrelers	111	7.2	0.0	0.0

The group of strong friends has an average F.I. of 32.2; that of weak friends has an average F.I. of 2.86. The Q.I.'s for the strong friends is 2.42 whereas that for the weak friends is .855. Strong friends, in other words, accept more of their total opportunities for disagreement than do weak friends. On the other hand, the Q/F ratio for strong friends is only one-fourth as large as that for weak friends. Strong friends quarrel less frequently in proportion to the amount of time they play together than do weak ones.

The strong mutual quarrelers present an interesting contrast to both the strong friends and the weak friends. These quarrelers have an F.I. of 10.85, which is far higher than that of the group as a whole, and strongly approaches the indices that were found for the children of the two eldest age groups with members of their own age and sex groups. The Q.I.'s for this group of quarrelers is twice that of the strong friends, and their Q/F is six times that of the strong friends. Even though they are quarrelsome, these children accept many more of their opportunities for playing together than do the weak friends or the groups as a whole. Inability to play peacefully together does not break up friendships at these early ages.

Finally the pairs of children who play together but never quarrel have lower mutual F.I.'s (average 7.2) than either the group of strong friends or strong quarrelers. The high Q.I. for the group of strong friends, the high F.I. for the group of strong quarrelers, and the moderate F.I. for the group that never quarrels all point toward a positive relationship between friendliness and quarreling.

In the group of strong friends 6 of the pairs are composed of girls, 3 of boys, and 1 of a boy and a girl. This latter pair were siblings. In the low friendship group, 2 of the pairs were composed of girls, and 8 of boy-girl combinations. In the high Q.I. group 5 pairs were boys and 5 were boy-girl combinations. These findings agree with other results in this study.

Of the 20 children in the high F.I. group, 85 per cent were from the 5- and 4-year-old groups. In the low F.I. group only 10 per cent came from the 5-year level, 65 per cent from the 4-year level, and the other 25 per cent from the 3-year. Because of their low degree of socialization, the two youngest ages are seldom represented in either the high or the low mutual friendship groups. Children who are strong mutual quarrelers, on the other hand, are about equally distributed among the four ages. The third year group leads with 35 per cent; the fifth, fourth, and second year groups make up 25, 20, and 20 per cent respectively of the mutual quarrelers.

The average difference in age between the two children in each of the ten pairs of the high F.I. group was 5.6 months. When the sibling pair was eliminated, this became 4.1 months. The average difference in age for the low F.I. group was 6.9 months. This would indicate that strong friends are more nearly equal in age, than are weaker friends. Children with high Q.I.'s are still further apart in age; in this case the average difference is 7.7.

The average difference in I.Q. for the high F.I. group is 9.2, for the low F.I. group 10.8, and for the high Q.I. group is 9 points. Hence the similarity in age seems to exert more influence on friendship than does similarity in intelligence.

THEORETICAL AND PRACTICAL IMPLICATIONS

Many points of evidence in this study lead to the conclusion that girls are more advanced in their social development than are boys. The fact that the number of friends that girls have, reaches the peak and begins to decline earlier, that girls reach their high point of quarrelsomeness earlier, and that the ratio of their quarrels to their friendships is consistently less than that of the boys, all lend credence to this hypothesis. If this theory is true, it will throw further light on the problem of sex differences, and will add socialization to the list of physical and mental traits wherein girls, at the early ages, show a more rapid progress than boys.

Although these results suggest a fundamental difference between the sexes in rate of maturation along social lines, nevertheless they do not rule out the possibility that differences in attitude and in training of boys and girls may exert a profound influence on their social behavior. It is not

within the realm of this study, however, to make any decision on the extent of native and acquired influences on social development.

The tendency for children to decrease the number of different companions as they grow older, and at the same time to increase the frequency of their companionship with a few individual children, suggests that development in social relationships, like that in physical, motor, and mental traits, proceeds from general to specific.

The relationship of quarreling to friendship that was found by the method of correlation and by the method of selecting pairs of mutual friends and pairs of mutual quarrelers, seems to indicate that quarreling is a necessary part of friendship at least in early childhood. Feuds and enmities apparently do not arise as the result of frequent disagreements among the preschool children.

While the conclusions that can be drawn from this study are mostly of a theoretical nature, a few practical implications are worth suggesting. Parents and teachers need not take children's quarrels too seriously or emphasize them by prohibitions, because quarreling is a socializing agent and enmities are not likely to result. Play that includes quarreling and making up, is excellent training and probably teaches children to minimize their grievances and to be good sports.

CONCLUSIONS

From forty 30-second observations of play and quarreling on each of 40 nursery school children, we may conclude:

1. The method of recording is consistent, as is indicated by perfect agreement in 85 per cent of the items obtained from the records of two simultaneous observers.

2. Reliability as computed from the raw data on group play, and from the friendship indices were .81 and .83 respectively. The coefficients from the quarrelsomeness indices were not quite so high.

3. High consistency in the data were obtained when the averages and percentages were computed for the first 20 and second 20 observations separately.

4. Friendship indices increase regularly with age. From 2 to 3 years this is due to increase in number of friends; from 3 to 5 it is due to increase in depth of friendship.

5. Sex differences in friendship were small. Girls had slightly more friends, boys formed deeper friendships.

6. The ratio of quarreling to friendships decreases regularly with age.

7. Boys are more quarrelsome than girls.

8. Unisexual friendships predominate.

9. Quarrelsomeness depends on the extent to which boys make up the group. Boy-boy groups are most quarrelsome; boy-girl groups next; and girl-girl groups are the least quarrelsome.

10. Friendship indices and quarrelsomeness indices correlate to .30.

11. Mutual friends are more quarrelsome, and mutual quarrelers are more friendly than the average; therefore, quarreling is a part of friendly social intercourse at these ages.

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Infection by Intestinal Protozoa in Relation to the Intelligence of Siblings[1]

MARGARET SCHELL

INTRODUCTION

THE effect of animal parasites on the development of children has been noted most frequently in cases infected with hookworm, an intestinal parasite, and with malaria, a blood-inhabiting protozoan parasite. Faust (1929) p. 375, and Manson-Bahr (1930) p. 594, state that heavy infections with hookworm before puberty retard sexual maturity, and Manson-Bahr (ibid., p. 54) reports a similar effect from malarial infection. A number of studies have been made of the relationship of parasitic infections to mental development. In 1915, Stiles (12) investigated the school grades of 2,166 white children, classified by age, sanitation, and by the presence or absence of the following intestinal parasites: hookworm, *Ascaris*, *Endamoeba coli*, and *Giardia*.

No evidence was found that infection with *Endamoeba coli* or *Giardia* was related to retardation in school grade. In an investigation by Strong (13) in 1916, the statement was made that "hookworm disease interferes very radically with mental development." This, however, was not supported by statistically reliable differences in mental test performance between infected and control groups, nor was there a reliable gain in the infected group, following cure.

In 1917, Kelly (5) compared two groups of children "cured of malaria" and "cured of malaria and hookworm" with a control group "free from malaria and hookworm." Arithmetic, reading and completion tests were given to the infected and control groups both before and after the cure of the former. Improvement from initial to final tests was reported as being greater in the experimental groups, although their relative gain was less striking in the case of mental tests than in the measurements of weight, vital capacity, and strength of grip.

In 1920 Myers (8) published results from an extensive study of hookworm in the draft army. Each subject found infected with hookworm was paired with an uninfected man from

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the same county, and their mental test scores were compared in Army Alpha and Beta. He concluded that the average person of a given community infected with hookworm is inferior mentally to the average person of the same community who is not infected. It is of course possible that this result is influenced by a negative correlation between intelligence and circumstances favoring infection.

Two other studies, by Waite and Neilson (14), and by Smillie and Spencer (11), agree in suggesting that mental retardation is associated with hookworm. That the association is small, is indicated by a correlation of .30 ± .06 (Otis I.Q., and hookworm frequency) computed by Paterson (9) for the data of Smillie and Spencer.

It is evident that further work in this field is needed, particularly with reference to the intestinal protozoa. The clinical effect of such infection has been most thoroughly studied in cases infected with *Endamoeba histolytica*. First recognized as a tropical disease characterized by dysentery, it is now known in the United States principally in the chronic phase, and frequently without dysenteric symptoms. Boyers, Kofoid and Swezy (1) emphasize the fatigability of persons with amebiasis. "They go to bed tired and arise in the morning tired; they are tired whether they work or rest; many of them are so tired they are in actual anguish; others merely say they have lost their 'pep.' .... Human amebiasis is a definite disease entity, protean in character as is syphilis, undramatic in behavior, subtle in its onset, and definitely nonbacterial in type."

Endamoeba coli, reported above as being investigated by Stiles in 1915, has since been subject to reclassification, a species now known as *Councilmania lafleuri* being distinguished from it. In 1921 Kofoid and Swezy (6) suggested that the amoeba appeared to be pathogenic, but that more evidence was needed; in 1927 Pickard (10) reported that *Councilmania lafleuri* is pathogenic in the manner that the small races of *Endamoeba histolytica* are pathogenic, promoting low grade neurotoxic disorders and constipation.

Giardia enterica, an intestinal flagellate protozoan, is associated at times with a type of recurring diarrhea accompanied by abdominal discomfort. (Manson-Bahr (7)). This infection is more common in children than in adults. The incidence of infection with *Giardia* reported by the Parasitological Laboratory of the University of California is more than twice as high in children from six to fourteen years of age as in cases from eighteen to twenty years old. In 470 children from twelve to fourteen years old the incidence of *Giardia* was 14.9 ± 1.1. In 601 persons aged eighteen to twenty years the incidence was 5.8 ± 0.7.

The procedure of the present study has involved a comparison of siblings, in which at least one member of a sibship was suffering from an active protozoan infection, and at least one sibling was diagnosed as free from infection. The value of the uninfected siblings as controls lies, of course, in the control of economic and social factors, and also in the limitation to some extent of genetic variation in the test as compared with the control group. In

such a study as that of Myers, mentioned above, there is always a possibility that the infected group is derived from lower social, economic and intellectual levels of the population. This is particularly likely in the case of protozoan infection, which may be transmitted, under unsanitary conditions, through fecal contamination of hands or of food. The present study was confined to the species *Endamoeba histolytica*, *Councilmania lafleuri*, and *Giardia* because these are the ones which have been reported as most likely to involve pathogenic nervous and digestive symptoms. Other protozoan species are unavoidably present in any infected group but were not used as the basis for selection of pairs of siblings, either because of their rare occurrence in the children examined, or because of lack of prior evidence that they have any physical pathogenic effects.

Location of subjects

From the records of the Parasitological Research Laboratory of the University of California, families were located in which there was a history of infection by pathogenic protozoa. From this sample, a selection was made of families containing two or more siblings under eighteen years of age. In preliminary home visits the writer, accompanied by a school nurse, explained the purpose of the investigation, emphasizing the fact that it was desired to compare "well" with "infected" children. The procedures were described for obtaining stool specimens and stamped mailing containers were left with each family. If specimens were not received within a reasonable time, a second or even third visit was made, to urge promptness in sending the specimens, or to recover unused containers.

Initial visits were made to 123 families. Coöperation was obtained from 88 of these. The chief reason for non-coöperation was the trouble involved in collecting the specimens, which many parents did not consider to be worth while for children who were not sick. The selective effect of this factor resulted in a lower proportion of older children being examined than younger ones, since the older children more commonly refused to collect stool specimens. A few cases of non-coöperation were due to religious objections, or to other resistance to medical or psycological procedures.

Laboratory procedure

A smear from each specimen was fixed in warm Schaudinn's fluid and stained with iron haematoxylin. One specimen from each child was examined for helminth ova by the Kofoid-Barber brine flotation method. One or two additional specimens were examined in this way from children in all families in which one child was found to have worms. The result of the laboratory examination of each child was reported to the parents, whether positive or negative; if positive, the suggestion was given that if the parent would show the report to the family physician or to the doctor at the Health Center, advice could be obtained as to the desirability of treatment, in that particular case. Care was taken to avoid alarming the parents.

Two hundred and twenty children were examined. Of 139, coming from families in which there had been a record of *E. histolytica* among parents or siblings, 6 per cent were found to be positive for the same infection. Of 152, coming from families with a record of *C. lafleuri*, 53 per cent were positive for the same infection.

Mental testing procedure

One hundred and fifty-six children were given the Stanford Revision,[2] including all cases in which a sibship was found to contain at least one infected and at least one uninfected member. In some of the families given stool examination, the siblings were found to be all positive or all negative (only the parents being infected); these cases were not used further in the study. The youngest were tested in their homes (using the Kuhlmann-Binet for a few cases under four years of age); the older ones at school. The tester did not know which children were positive or negative as to infection. The I.Q.'s of the group ranged from 61 to 132, with a mean of 95.8 ± 2.2; the C.A. range was from 2 to 17 years.

As has been demonstrated in recent studies at the Institute of Child Welfare (3), raw I.Q.'s tend to give spurious results if used in investigations of this character without correction for C.A. For the total group of 156 children, $r_{\text{C.A.}\cdot\text{I.Q.}} = -.316$. Age·I.Q. correlations were also computed for the infected and non-infected groups taken separately, but they were not found to be reliably different in the 2 groups. All I.Q.'s were corrected to the mean C.A. of 123 months, the correction making use of the regression formula given by Hsiao (3): $r_{\text{C.A.}\cdot\text{I.Q.}} \frac{\sigma \text{I.A}}{\sigma \text{C.A}}$. On the basis of this formula, .105 was added to the child's I.Q. for each month of his age in excess of 123, or subtracted for each month that he was younger than 123.

[2] These tests were administered by Miss Dorothy Dunn, Research Assistant at the Institute of Child Welfare.

RESULTS

The first comparisons will be for a group with mixed infections. Eighty-nine sibling pairs are represented, based on 70 infected children and 54 control siblings. The infections considered are *Endamoeba histolytica*, present in 13 cases; *Councilmania lafleuri*, present in 46 cases; and *Giardia enterica*, present in 23 cases. There were also 11 cases with *Endamoeba coli*, 5 with *Chilomastix davainei*, and 1 each with *Craigia hominis* and *Councilmania dissimilis*. Among 23 of the children, more than one of these species occurred. None of the foregoing species of protozoa were found in the control siblings, although they sometimes showed *Endolimax nana* or *Councilmania tenuis;* these were also present in the infected group, but were not listed as of pathogenic significance. For this group of children the mean I.Q. of the infected cases is 97.5, with an S.D. of 14.5. For the control siblings, the mean I.Q. is 97.2, also with an S.D. of 14.5. In 48 per cent of the pairs, the infected sibling has a higher I.Q. than the control sibling, in 52 per cent the control sibling is higher.

If now we consider the individual pair differences in terms not merely of mixed infection, but also of the presence or absence of the two chief pathogenic agents with which we are here concerned (*Endamoeba histolytica* and

Councilmania lafleuri) we obtain the results given in table 1.

When compared with their controls, children with *Endamoeba histolytica* show no difference in average I.Q., nor is any difference shown for children with *Councilmania lafleuri*. In all of these subsamples, the means are unreliably different from each other, and unreliably different from the mean of the total group. The number of cases is probably large enough to have indicated an effect on the I.Q. had such existed of the magnitude reported for hookworm.

TABLE 1

Individual pair comparisons: Number of cases in which control and infected siblings differ by given degrees of I.Q.

	AMOUNT OF DIFFERENCE IN I.Q.						
	0-5	6-10	11-15	16-20	21-25	26-30	31-35
Mixed infection:							
Control > Infected	17	9	10	5	1	2	2
Infected > Control	12	8	8	9	5	1	
Endamoeba histolytica:							
Control > Infected	8	3	2	1		1	
Infected > Control	12	3	3	3	1		
Councilmania lafleuri:							
Control > Infected	17	6	8	6	2	1	2
Infected > Control	9	10	5	5	3	1	

Possible differences in personality traits may also be of some interest. In the course of testing, ratings were made of the children's attitudes to the test situation. Coöperation, effort, speed, and inhibition were each rated (in terms of specific subtraits) on a 7 point scale. No significant differences were observed, between infected and control children.

Further evidence pertaining to intelligence, may be derived from a consideration of the sibling correlation, which in representative samples is usually in the neighborhood of .50. Any environmental factors exerting a systematic effect upon one member of each sibling pair would tend to reduce the correlation. For 89 pairs the actual sibling r (calculated by the method of single entry) is $.57 \pm .048$.

SUMMARY

1. The purpose of this study was to investigate, in a preliminary manner, the possible effects of intestinal protozoan infection upon mental development.

2. The Stanford Revision was given to 156 children from families in which at least one child was infected with *Endamoeba histolytica*, *Councilmania lafleuri*, or *Giardia enterica*, and in which at least one child was negative with regard to these infections. After I.Q.'s were corrected to the mean C.A. of the group, each infected child was compared with each of his uninfected siblings.

3. The mean I.Q. of the infected siblings was 97.5; of the controls, 97.2; the S.D. for both groups was 14.5.

4. In the 52 per cent of the 89 pairs

the control sibling had a higher I.Q. than the infected child; in 48 per cent the infected sibling had the higher I.Q. The sibling correlation was .57 ± .048.

5. The attitudes of the children in relation to the test situation were compared with respect to coöperation, effort, speed, and inhibition. No significant differences were observed between infected and control children.

6. There is no evidence of a difference in I.Q. correlated with the presence of the intestinal protozoa, nor of an increase in I.Q. variability, nor of a difference in specified personality traits. The data are in agreement with the general findings reported in critical reviews by Paterson (9) and by Jones (4), indicating the absence of any substantial relationship between intellect and measures of physical condition.

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Some Undesirable Habits in Children and Their Management

ALFRED GORDON, M.D.

TO DISCUSS "the child" is an endless task. Its characteristics, tendencies, emotional life, development, finally its behavior and conduct,—are all such vast chapters of study and observation that each of these elements will require a separate volume in order to present them in a more or less complete form. The child's age is the period of life when foundations must be laid for the building up of a physical, mental, and emotional structure which will direct in one way or in another the individual's relation to other members of the community in which he lives and which will contribute to the happiness and progress or else to the misery and failure of his surroundings. It is at that age that initial direction is acquired for those forces which will guide the future man or woman in their adaptations in the struggle for existence. Adaptation implies the coöperation of a great many units of the individual's mental and emotional characteristics. There must be a constant conflict among the latter with the end result either of victory or of collapse. This will be manifested in the individual's "behavior." Behavior therefore is the resultant of the individual's life adaptations. To cover in one discourse all important forces which influence behavior will necessitate considerable time. Among the large number I have selected only a few because they present a special practical interest and a serious problem for the parents. In discussing them I will not fail to bear in mind that I am addressing an assembly of lay persons and consequently will avoid terms, interpretations and explanations of an academic character.

In the life history of a child there are a few special features which frequently give the parents considerable concern. I have reference to "special habits" which the child acquires before the school age and during the latter. I shall not dwell upon a few habits observed in early infancy, such as thumb-sucking or tongue-sucking, which parents frequently encourage to prevent the child from crying, thus obtaining rest. I shall not arrest your attention on teeth-grinding or nail-biting which, although they have their special meaning, nevertheless are not of sufficient practical importance to elaborate upon. I will entertain you with more serious manifestations which occur in childhood beyond infancy and which may have a direct and grave influence upon the formation of the child's character and future behavior.

When a child develops a desire for telling "lies," which desire becomes

eventually a strong habit, the situation is serious. This phenomenon is the result of several causative factors, chiefly of inheritance, but, let us remember, also of environmental circumstances. Parents and teachers should not ignore the fact that it is important and it is possible to prevent the full development of the tendency for lying the moment it is first noticed, because it is susceptible to treatment. The common belief that lying in a child is a necessary evil is a grave error. The lie may be at first only an occasional occurrence, but when it is permitted to repeat itself, it may gain such a strong foot-hold and become such a deep-seated habit that it might become difficult to be eradicated and this pernicious habit is carried to adolescence and manhood or womanhood, affecting daily life in all its phases and leading to very serious consequences with criminality as a result. Permit me therefore to present to you a few hints which may be helpful in the management of this abnormality. First of all, it is necessary under all circumstances and conditions and as early as possible to be frank and truthful with children. Should the child commit his first or a repeated offense in telling a deliberate untruth, no undue punishment should be administered. In fact, punishment in all such cases does no good, because it creates and develops fear, which by itself is the cause of lying. Thus the child will be obsessed on one hand by fear of being punished for telling lies and on the other hand he will tell lies to avoid punishment. He will live in a vicious circle. There is another important warning to the parents and teachers when they are confronted with evident children's lies. It would be very wise and prudent not to question such children too closely on the subject of their lies. Unless the questioning is done skilfully and intelligently such a procedure may lead to forced misstatements on the part of the child which eventually may develop into deliberate and conscious deception and fraud and thus prepare the individual for a life of delinquency and all kinds of criminality. Proceeding further, I may also caution you against an unnecessary and perhaps harmful method in dealing with lies in an immature child. That is, preaching and pointing out to this undeveloped bit of humanity that the evils of lying is not only useless but it may become harmful for the following reasons: First, in so doing we may exaggerate or magnify the most insignificant deviation from the truth. Second, we may suggest to the child undesirable thoughts which otherwise would have never perhaps entered the child's mind, and, as you know, a child is extremely suggestible. When parents and teachers keep on admonishing the children with: "You must not do this or that, you must not speak so and so," such a procedure is by itself a suggestion to the child for violating prohibited acts. On the other hand, when the child is taught and shown how to control himself on every occasion, and how to own up to a mistake or to a wrong act committed by him, when all that is done in a kindly and intelligent manner, the child's confidence will be gained and the results will be most gratifying in the struggle against repetition of falsehoods. In our at-

tempts to correct the habit of lying in children, we must invariably hold their attention close to reality and not to fantastic and abstract ideas on truth and untruth, because overstimulation of their imagination may prevent them from discriminating the real and the unreal.

The second abnormal habit in children which may lead to grave consequences is "stealing." We all know that a child has no sense of personal property. Not infrequently we observe children wanting to go through the pockets of others. Some of them, when they are sent on errands, do not spend as much as they are told to do and keep the balance for themselves. Some bring home things which, they say, were found by them on the street. These are all examples of various forms of theft. They are all serious and even dangerous habits, as they mean encroachment upon another's private property or an aggression by himself toward another person. They mean the existence in the child of a strong pernicious desire to deprive another person of things to which he is not entitled or to attack the rights of other people. They mean that if this habit is maintained during childhood, grosser delinquent acts of a more serious nature will be committed later in youth and adult age, such as pocket-picking, purse-snatching, stealing unlocked property, burglaries, highway robbery, larceny of all degrees, forgery, passing worthless checks, etc. Not infrequently we see children supplied by their overindulgent parents with ample pocket-money. If this habit is established and for one reason or another the child should be deprived of further supply, he may resort to stealing in order to satisfy his taste or greed for luxuries developed by unreasonable parents.

The third form of habits in children which may lead to grave consequences is "truancy or vagrancy." It usually happens that during the day, when the child cannot find desirable companions for play or other purposes, he runs away either from school or from work. A poverty-stricken or an unhappy home with bad surroundings may lead the boy to abandon it temporarily and repeat the act so frequently that a habit becomes established. When the school teacher is unable to understand her pupils, especially the neurotic children, and handles them unreasonably either by exacting mental work for which they are not prepared or threatening or punishing them severely, such children will look for and find opportunities to run away from school. In some such instances I observed children leave their homes in the morning for school but never reach it, and go off with undesirable gangs in a different direction. Restlessness, irritability, nervousness and especially discontent either with their home or school made those children find a way whereby they could obtain satisfaction or at least relief and an outlet for their pent-up emotional forces. As a rule these truant children spend their time in company of other young or older delinquents, and they fall into further delinquency in either case. Statistics show that truancy or vagrancy is a factor in over half of the cases of various delinquent offenses against society. Much can be done for these truant youngsters if parents

would be sufficiently interested to make sacrifices of their time or to try to surround the children with desirable companions for whom they crave. Since truancy represents an effort to escape from an undesirable environment, it should be looked upon with grave concern. Punishing a truant child will accomplish nothing and does not solve the problem.

These few examples are chosen to show how vast and complex is the problem of dealing with children. Habits and especially bad habits are very difficult propositions for parents. They are the most potent factors in delinquency. A wrong act once committed may be repeated more or less automatically by force of habit and especially when it may bring pleasure or satisfaction. The more often the delinquent behavior is repeated and the more it is attended with pleasant circumstances the more established becomes the habit. Moreover a delinquent habit may persist long after the original cause of its existence has disappeared. We may even remove the cause which leads a boy to steal, pick pockets, lie, run away from home or school, but still the delinquent habits may remain because of habit.

Let me now point out to you with some emphasis some of the conditions which may contribute to the formation of undesirable habits and to delinquency. I will not dwell on bad inheritance. That instinctive and hereditary tendencies are the roots from which the physical, mental, and moral life develops, is a well established fact. Not much can be accomplished in cases of children, with inherent mental limitations, but personality and its component parts are also to a considerable degree molded by environmental conditions. It is on the latter that our efforts must be concentrated, as they are amenable to improvement. Among the environmental elements "home" is the most potent. In considering home conditions the following may contribute to delinquency:

1. Unsanitary features: They undermine the child's physical health and indirectly his mental health and consequently reduce his vitality and his power to control his behavior.

2. Crowded homes: There children frequently witness scenes between the elders which gives their immature minds suggestions for delinquency.

3. Material poverty, which may lead to lying and stealing. With poverty are closely associated, poor health, overcrowding, neglect, ill-tempered parents and so forth. Thefts of all kinds and hold-ups result from longing for food, clothing, shelter. Fifty-five per cent. of young delinquents in London come from homes that are below the poverty line.

4. In some cases excess in material things permitted by over-indulgent parents leads to a lack of appreciation of values and poor self-discipline with the result that the child may become incorrigible and commit offenses ranging from petty larceny, setting fires, burglary and even murder.

5. Disrupted homes, either through death of parents or divorce. In both cases the child loses necessary examples, guidance, discipline or affection, which all are so essential in his development. It was observed that 79 per cent. of delinquencies occur

where the home was disrupted during the childhood of the individual.

6. Mental abnormalities of parents, bad habits of parents such as drunkenness, immorality or criminal tendencies in the parents are bound to have a pernicious effect on the children through the innate tendency for immitation, misguided teaching, disgust, antipathy against the home, shame, a feeling of degradation, and loss of respect for parents. Lying, stealing, and running away are common occurrences all resulting in gross delinquencies.

7. Ill treatment by guardians, foster-parents, or step-parents leads the child gradually to truancy or vagrancy; he then gets in with gangs and thus drifts into delinquency. In all such cases a feeling of resentment develops in children against those people. Because of this feeling their influence by work or example becomes insignificant. The child may become stubborn and this state will keep him from being benefited by the small amount of parental discipline. He will then remain a slave to his instincts and emotions.

8. Unhappy relationship between father and mother is a frequent cause of the child's unhappiness, which, if continued, will develop undesirable tendencies in him.

9. Finally, misdirected discipline is a frequent cause for delinquency. Over-indulgence or else over-restriction on the part of the parents makes the child react in an abnormal way. Desire for forbidden things becomes great and the child will seek satisfaction outside of home in a delinquent manner. Forbidding things in an unreasonable and inconsistent manner will react on the child so that he will oppose his parents in everything and it will make more intense his desire to do forbidden things until it gets the best of him. If severity and punishment are practiced, the child will seek satisfaction outside with a bad effect on his behavior. Favoritism and injustice are promptly felt and resented by children. They lose respect for parents and seek compensation in abnormal ways. Nagging and creating fear in a child is dangerous for its physical and mental development. The fear fixes the undesirable tendency in its mind and it attempts to escape from it through some abnormal act.

All these factors must be borne in mind when we are confronted with cases of bad habits leading to delinquencies. No individual case can be treated in a satisfactory manner without adequate knowledge of all causes of the trouble. Facts must be obtained from many sources.

In concluding the few thoughts presented here I wish to emphasize the fact that all I said is only a small part of all the causes of delinquency. I have selected but a few to indicate how serious the problem of the child is. Among all the factors that enter into consideration when the personality and behavior of the child are observed and studied, "parents and home" are the most potent elements which have an influence on and shape the destiny of the future man and woman. The home must be considered the workshop in which the personality of the child is being developed. The character, attitude and mutual relationship of parents and the child

lay the foundation of the mental atmosphere in which the child lives, grows, and imitates, undergoes suggestions, forms habits, and prepares himself for future activities to become a member of the community and in his turn to become a parent when he will play his part in developing the personalities of the next generation. The child who is deprived of sympathy and affectionate attention at home misses the most important elements in his preparation for mental and emotional growth. Encouragement to effort and confidence in himself, relief from emotional strain, sympathy that helps a child bear bravely gross and small disappointments, development of affectionate response in cases of unhappy incidents in the life of father and mother, and of the outside world—all these elements are highly essential in the development of a normal child. Should they be lacking in the home, the child'sb ehavior will suffer irreparably. The lack of joy in home or the want of emotional comfort will lead the child to abnormal tendencies and undesirable habits, such as were mentioned above, and turn the child delinquent with all the unhappy consequences to himself and to the community in which he lives. Statistics show that home is overwhelmingly more influential than the street in producing delinquency. Home environment in all its details presents the best field for preventive work.

Some Factors and Characteristics of Childhood Memories

GEORGE J. DUDYCHA AND MARTHA M. DUDYCHA

THE general character, vividness and number of one's childhood memories depend upon a number of factors. Since the memory of incidents experienced consciously depends upon ideas, and since ideas in turn depend upon language, it is reasonable to suppose that the extent of the child's language development determines, in part at least, the range and variety of his memories. As may be observed from the results given below, practically every memory, with the possible exception of one or two, dates back to a period when elementary language habits were rather firmly established. Although it would be interesting and highly instructive to ascertain the extent of the correlation between language development and childhood memories, no information is at present available which would permit such a correlation. It would be extremely difficult to obtain valid information as to the exact age at which the subjects began to use language and the rate at which new language habits were established.

A second factor, and one which is intimately related to language, is intelligence. One who is distinctly handicapped as to his intellectual equipment is limited as to his range of experience and hence the variety and number of his memories. Whether this holds for individuals who have average or above average intelligence is still a question. A third factor is the child's health and physical vigor which determines the range and intensity of childhood experiences. Certainly the variety of the situations encountered during early life must be added as a fourth factor. This variety may pertain to such things as: physical conditions, adults, children, native attention factors *et cetera*. Other factors of importance are: fifth, age; sixth, sex, and seventh, emotion.

In the present article we are interested in five factors: namely, the nature of the emotion experienced, the nature of the situation which gave rise to the experience, the age at which the experience was had, the relationship between childhood memories and intelligence, and the similarities and differences between the memories reported by men and by women.

METHODS OF OBTAINING THE DATA

The memories reported are those of college students. The students were met in class groups and were asked to write out a complete account of the earliest experience which they could remember. They were strongly encouraged to report upon their earliest

memory or memories, if they had several, and not to exercise any selection with regard to them, but to report all memories as faithfully as possible. They were cautioned, further, with regard to reporting upon childhood exploits which have been frequently recounted in their hearing, but which are not remembered by them. Not only was a faithful account of the original incident desired, but also the exact age when it was experienced and the nature of the emotion which accompanied the experience.

Each memory was reported on a separate sheet of paper, regardless of the number of memories which were reported by any one student, so that it could be handled conveniently, and readily classified according to the various factors involved. The standard form used for reporting the memories is shown on page 268.

Some of the questions asked in the above form were expressly asked with the view of providing a check upon the accuracy of other statements, as age and nature of emotion. For instance, in some cases a comparison of the birth date and season of the year when the experience was had with the age given revealed inconsistencies which were later removed. Or again, a comparison of the emotion reported, with the "reason why experience was remembered," indicated whether or not the reported emotion was most likely to have been the one experienced at the time of the original incident.

After all of the memories were carefully read by the present writers and notations were made as to possible inaccuracies of report, each student was consulted privately concerning the memory or memories which he reported. The age at which the experience remembered was had was carefully checked. If the student was uncertain as to his age, he was requested to check up with his parents or relatives and thus ascertain his correct age as accurately as possible. The procedure suggested to the student was to relate his experience to other incidents which he knows happened about the same time as the one reported. In many instances such things as the death of relatives, the birth or death of siblings, moving from one location to another or to a different community, the remodeling or erection of buildings, trips to unfamiliar places, various holidays or particular celebrations, entering school, outstanding events or catastrophies, such as great fires *et cetera* were used as guides in placing the incidents remembered. Parents and other individuals who were adults or near adults when the subjects were children, aided greatly in dating the memories.

Some of the subjects were able to locate the incident remembered with such accuracy that the exact day was given. Those students who were somewhat uncertain as to their age at the time of the experience reported, checked up with their parents and verified their ages to within one month of the exact age. Since great care and much caution was exercised in this matter, the writers feel that the ages reported for the memories are reliable. No memory was retained which dated beyond the fifth birthday, or which could not be placed within one month of the exact age. If there was any cause for suspicion or indication that

a student was not coöperating, his memories were discarded. Thus the only memories which have been retained for this study are such as have passed a rigid test of inspection and criticism.

Childhood memories and intelligence. One is quite likely to suppose that the more intelligent the child the earlier his memories, and thus that there may be a positive correlation between intelligence and age. This proposition was tested. The "Psychological Examination" (1932 edition) published by the American Council on Education, was given to as many of the students who reported memories as possible. The test was given to 129 students and the score obtained for each was correlated with the age of the earliest memory reported by each. If a student reported two or more memories, as some did, only his earliest memory was used in the correlation. The coefficient of correlation obtained is −.016. The P.E.r is .06. It is evident from these results that the coefficient of correlation is for all practical purposes zero. The more intelligent individual does not seem to be any more able to recall early memories than the less intelligent.

There are a number of other interesting observations which may be made in this comparison of intelligence and childhood memories. In table 1, we have a comparison of the three individuals who ranked highest on the intelligence test, and the three individuals who reported the three earliest memories. We see that the individual who ranked first on the intelligence test reported a fairly early memory, but not the earliest; the one ranking second reported a fairly late memory, and the one ranking third reported one that is not much earlier than the average. Turning to the three earliest memories, we find that the student who had the earliest memory also had a high score on the intelligence test; the one ranking second had a low score which is below Q1, and the one ranking third had a score which is within a few points of Q3. For the intelligence test scores, Q1 is 142.81, Q3 is 219.75, and the median is 176.875.

When we turn to the memories of the three individuals ranking lowest on intelligence, we find that the one ranking lowest reported a memory of an experience had at an age but little earlier than the average; the one ranking second lowest reported one at an age much earlier than the average, and the third lowest had a memory at an age later than the average.

TABLE 1

INTELLIGENCE			MEMORIES		
Rank order	Intelligence score	Age	Rank order	Age	Intelligence score
1	335	2:5	1	1:0	231
2	294	4:1	2	1:5	119
3	286	3:2	3	1:6	216
127	69	3:1			
128	64	4:10			
129	60	3:11			

Although we find that the distribution of cases on the correlation graph in both the upper and the lower quartiles is fairly uniform, when we note the ten memories reported between the ages of one and two years inclusive, we find that eight of the ten individuals who reported these memories have an

intelligence score which is above the average, and five of these are in the upper quartile. Thus we see that in spite of the zero correlation which was obtained, of the ten earliest memories only two or twenty per cent are in the lower quartile and five or fifty per cent are in the upper quartile.

Childhood memories and emotions. Of the 233 memories reported in this study, 134 or 57.5 per cent were reported by men and 99 or 42.5 per cent were reported by women. The mean age for the men is three years and eight months; for the women it is three years and six months, and for the whole group it is three years and seven months. If we examine the distribution of memories as to years, we find that 5 or 2 per cent were reported for the fifth birthday, 88 or 38 per cent dated back to the fourth year, 86 or 37 per cent to the third year, 44 or 19 per cent to the second year, and 10 or 4 per cent to the first year. With regard to the emotions, which the students felt confident were had at the time of the experiences remembered, we find that *fear* is recorded most often including 71 or 30.4 per cent of the memories; *joy* ranks second including 65 or 27.9 per cent; *anger* is third with 24 or 10.3 per cent; *wonder and curiosity* is fourth with 19 or 08.1 per cent; *sorrow and disappointment* is fifth with 15 or 06.4 per cent; *pain* is sixth with 12 or 05.2 per cent; *shame and guilt* is seven with 6 or 02.6 per cent; all other emotions including 9 or 03.8 per cent and those reports on which no emotions were indicated include 12 or 05.2 per cent. The mean ages for all the memories—male and female—for each emotion are as follows: (1) fear 3:8, (2) joy 3:8, (3) anger 3:7, (4) wonder and curiosity 3:8, (5) sorrow and disappointment 3:5, (6) pain 3:1, (7) shame and guilt 3:6, (8) various other emotions 3:6, (9) memories without specific emotions 3:5. It is interesting, in this connection, that there is not a great deal of variation in the mean age as we go from

FORM FOR REPORTING MEMORIES

Name..... Date.....
Date of birth....., ..., ... Sex.....
(month, day, year)
Name of emotion experienced.....
Age at which experience was had....., ... Int. score.....
(years, months)
Was this your { exact age..... / approximate age..... / guessed age..... } at the time of this experience?
Is it possible for you to check up on the age given above? Yes..... No.....
At what time of the year did you have this experience?.....
Does anyone know about this experience? ..... Who?.....
Are you { absolutely certain..... / quite certain..... / somewhat uncertain..... } that you remember this experience?
Has anyone told you about this experience? Yes..... No.....
Why do you remember this experience?.....
....(Experience remembered).....

emotion to emotion. The lowest mean age for any of the emotions is 3:1, but this constitutes but a small percentage of the total group.

There are also some interesting sex differences which we must call attention to here. The rank order of the emotions for the men is the same as that for the whole group partly because they constitute nearly three-fifths of the total number; but the women do not follow this order entirely. Whereas 37.3 per cent of the male memories involve fear and 23.9 per cent involve joy, only 21.2 per cent of the female memories include fear and 33.3 per cent include joy. Thus on the basis of these results, it seems that girls remember joyful rather than fearful experiences, whereas boys recall fearful experiences more often than joyful ones. But on the other hand women report more situations in which they were angry than the men (13.1 per cent of the females and 08.2 per cent of the males). With regard to wonder and curiosity, the women report more memories than the men (09.1 per cent and 07.5 per cent). The percentage is practically the same for both men and women concerning those memories which include sorrow and disappointment, and pain. Although shame and guilt is reported in more of the memories recalled by women than by men (04 per cent and 01.5 per cent), the mean age for the men (2:9) is much below that for the women (3:11). This latter fact also holds true for pain, although the age difference is not as great.

With these facts in mind, let us turn to a more careful consideration of the particular memories which have been secured, with special emphasis upon the nature of the situations which gave rise to those prominent experiences which are so well remembered. We shall also note sex differences and similarities.

The emotion of fear. As was pointed out above, fear, which was reported in 30.4 per cent of the collected memories, is the most prominent emotion in childhood experiences. We observe further, that there are ten general situations, which gave rise to these fearful experiences. These situations, in their order of frequency as determined by the whole group, involve: (1) animals, (2) punishment, (3) strange situations, people and objects, (4) accidents, (5) statements made by adults, (6) death and funerals, (7) falling into water, (8) fire, (9) being alone, and (10) storms.

A number of sex differences may be noted at this point. In each of the first 5 situations we find that the memories reported by men outnumber those reported by women. Since boys are frequently more bold and adventurous than girls, and since boys have traditionally been given more freedom, it is likely that they have more frequent contact with animals and situations which result in accident. Their frequent exploits result in the transgression of parental commands and this gives rise to anticipated or actual administration of punishment. "Statements made by adults" is a situation closely akin to that of punishment. Fear resulting from falling into water and from experimenting with fire was reported by the men only. On the other hand, only women reported memories of the fear experienced as a

result of being alone. Only one boy and one girl reported memories of severe storms.

A number of the more representative memories which involve fear resulting from various situations are given below, beginning with the fear of animals which includes 15 memories.

N. N. when a small boy aged 4:1 was attacked by a very vicious rooster.

The experience which I remember is concerning the acquisition and demise of a peculiarly vicious rooster. My father purchased a live rooster one day and brought him home for my amusement. I was very young at this time and consequently quite small. The rooster, however, seemed to me to be large, very large, and not the least bit playful. No sooner did I enter the yard in which he was kept than he would rush at me, flap his wings, and claw my hands and face. He was, in short, a very vicious rooster of which I was dreadfully afraid. Finally he became so disagreeable that my parents were forced to kill him.

A little girl, L. T. aged 2:11, had a very memorable experience with ornamental, iron lions.

A short time before my third birthday my aunt had charge of me for one day. She took me for a walk past the Public Library, in front of which were two large iron lions one on each side of the steps. Since I had heard many stories about wild animals, I was interested in these lions and wanted to climb on them. But when my aunt put me on one of the lions and I found myself actually sitting on his back with his big tail lashing, and his huge teeth snarling at me, I almost had a spasm of fear before she could get me off his back.

Another boy remembers that when he was 3:5 he attended a movie with his parents.

At the movie I saw a full screen picture of the German crest with the eagle upon it, and that night I dreamed that this eagle was after me.

This is the only memory of a childhood dream reported.

A last memory involving fear of animals is that of Q. K., a boy, aged 2:7.

I was very much fascinated by bugs of any kind, large or small. One day, while playing outside, I found a large pinch bug. Up to this time I had never found a bug which had hurt me in any way, and so I was not at all careful to keep my fingers from his pinchers. Suddenly he clasped them about the little finger of my right hand. I ran to the house screaming. So securely was he attached to my finger that it was necessary for my father to cut the pinchers off with a pair of shears. For a long time afterward I was very careful; bugs still fascinated me, but I usually poked them about with sticks.

Horses figured in 3 of the memories, roosters in 2 and each of the following in 1 each: eagle, gander, parrakeet, wolf, bear, lion, cows, pigs, white rats, and a pinch bug. All of these were not live animals; some were merely imagined, others were pictured and still others were of metal.

The second general situation was fear which resulted from or was due to an anticipation of punishment. In only seven of the thirteen cases some form of punishment was actually administered. The following two cases are typical.

L. S. T. when a little girl of 3:1 was thoroughly frightened by being punished. She says:

The experience occurred when my father found me guilty of throwing stones at the neighbor boy, and of pounding off beetles' wings with stones on the sidewalk. The punishment consisted of being sent to bed without any supper, a mild enough penalty, but nevertheless very outstanding in my

memory because of the fear I experienced. Through my mind raced thoughts of being turned out of house and home and being shunned by my friends. The next morning found my mental outlook as bright as usual, however.

The second memory is that of a boy who was 4:7 at the time he was punished.

One day another boy and I took some matches and went down town. We went to an old shed, which was behind a saloon, in which many boxes and papers were thrown. We got the idea of starting a little fire which we proceeded to do. Soon the bartender saw the smoke coming from the shed and so came out to investigate. He came upon us so suddenly that we were thoroughly frightened, and the spanking he gave us, I distinctly remember.

The third grouping under fear includes memories of fear due to the strange, that is, strange situations, strange objects or strange people. An equal number of these memories was contributed by each sex. The first memory given below is that of K. E., a boy who at the age of 2:6 was extremely afraid of a steam roller.

During the summer before my third birthday a street was paved a half a block from our house. Up to this time I had never seen a steam roller such as was used by the paving crew. The first time I gazed upon this monster which belched black smoke and made so much noise, I became very frightened and ran to one corner of the porch and covered my eyes with my hands. After that first day, I would run to this same corner every time I heard the steam roller, whether it was within one block or six blocks, and stayed there until it was out of sight and hearing. This continued for nearly a week before my mother found out about it, but she could do nothing to lessen my fear. A few days later I was invited to my chum's party. He lived on the very street where the steam roller was being used. On the day of the party, however, it was too hot for the street crew to work, and it happened that the steam roller was left parked in front of my chum's house. Of course, the other boys wanted to play on it, but I was afraid. They, however, went up to it, touched it and climbed on it just to prove to me that it wouldn't harm me. At last I ventured forward step by step, encouraged by their words, until I touched it and then climbed on it. My fear of this monster was gone at last, and I didn't run to the corner to hide after that.

A second memory is that of L. M. T. who was afraid of Santa Claus when she was a little girl of 4:9.

I remember that on the night of our Christmas program at church Mother was helping my brother and me get ready. All of a sudden Santa Claus stood in the doorway and asked me where I was going. The extreme fear caused by the strangeness and suddenness of his presence made me rigid—and I remember screaming. In order to calm me down Mother told me stories which I do not remember. The Santa Claus was my father who was also on the church program.

In the case of the other memories which involve fear of the strange, three were afraid of strange, exciting situations, three others were afraid of strange loud sounds two of which involved the noise made by the noisy automobiles of that day, and four others where afraid of strangers.

Of the 9 memories involving fear due to accidents, 8 were reported by boys. Two of the accidents were due to runaway horses; 2 resulted from playing with sharp objects as an axe and knife; 2 other boys were frigntened as a result of falling; another became frightened after he had stuffed a blue crayon up his nose. The one girl was filled with fear when she saw her grand-

mother fall. The memory of V. N. is typical. When V. N. was a small boy of 2:11, he was nearly run over by a street car.

A street car ran past our house. One day while I was playing on the track, the car came along. The operator did not see me immediately and hence he could not stop the car until it was on top of me. When it came to a dead stop, I was just in front of the wheels. I can still see that car coming, and feel how rigid with fear I was.

Again we note that more boys than girls report memories of fear due to statements made by adults. Parents frequently try to frighten their children into obedience by threatening them with the bogie-man, sandman and other such mythical characters. Two memories of this group are particualrly interesting. Both of these were reported by boys. The first is that of B. P. who was 3:4 at the time of the incident.

I was rather a naughty boy. I don't remember what I was doing, but I remember Mother telling me that if I didn't behave the devil would come to me in the shape of a snake. I told her that I didn't care if he did. Then I went out to play in my sand pile, where I saw a little grass snake. I ran to the house screaming that the devil was in my sand pile. Mother killed the snake with a stick, and I was satisfied because I thought that the devil was dead.

The second memory is that of E. S., a boy, who was 4:3 at the time.

When I was 4:3 I swallowed a prune stone while eating breakfast. I was much alarmed and frightened when told: "If you get your feet into any mud, you will grow into a prune tree." This same morning there was a heavy shower. After the shower I was allowed to go outside to play and almost immediately got stuck in a mud puddle. I shouted and screamed for help, but I was only laughed at by the other members of the family. I sincerely thought I would grow into a prune tree and hence my great fear.

Only 4 memories were due to a fear of death and 3 of these were fear of drowning. A few days before his third birthday, V. I., who at that time lived but a block from the river, wandered down to the river where the ice company was harvesting ice. Accidentally V. I., who was then standing near the water's edge, was pushed or bumped into the channel. A man standing nearby, quickly fished the frightened boy out with a pike pole and carried him home.

The emotion I experienced was fear of death. And after I was again permitted to go outside, I didn't go down to the river because of fear, for I thought that I had just about lost my life.

Four additional memories resulted from falling into water, but there is no evidence of fear of death in these. Q. L., when a small boy of 4:4, jumped from a boat into the water because of fear.

When four years old, I accompanied my parents on a fishing trip which lasted several days. One day while playing in a boat, which was tied by a slack rope to a post of the dock, the boat began to drift out from the pier. As soon as I noticed that the boat was drifting out from shore, I jumped into the water. Since the water was over my head, I floundered about and called for help. My father soon rescued me.

Three boys remembered starting fires, two of which resulted in extensive barn fires. Z. T. was 4:8 when he set fire to the barn.

I had a peculiar liking for building little fires. It was always great fun to smuggle

out a few matches and build a little fire and pretend that it was a huge camp fire. Stories of camp life particularly interested me and it was due to this that I think the following incident happened.

About noon-time, equipped with matches with which to build a little camp fire and supposedly to cook my noon-day meal, I crawled into a barn at our home. Finding some cornstalks nearby I lighted them and found that the fire grew to proportions I had not foreseen. Becoming frightened at the size of the fire and the reaction of the animals, I piled up several boxes and climbed out of a window not surrounded by flames.

Mother was home alone with no possible chance of saving any of the stock or machinery. I remember the neighbors arriving in any means of conveyance and the futile effort that they made to save the stock that was being burned within the barn. I shall never forget the frantic efforts of my mother to fight the blaze, nor will I forget Dad when he arrived after it was all over. He scolded me severely but then picked me up and said that he was glad that I got out alive and unhurt. I don't recall ever wanting to play with matches after that.

Only girls reported incidents in which they were afraid of being alone. When Z. I. was a little girl of 1:11, she had the following experience.

When my parents went to attend my aunt's wedding, I was left with a friend of the family. That afternoon Mrs. B—— put me to bed for my afternoon nap. When I awoke from my nap, I had a peculiar feeling of being alone and hence cried lustily until Mrs. B—— came into the room.

One boy and one girl reported memories of severe storms. E. X. was a small boy of 4:10 when he had the following experience with a cyclone.

It was Palm Sunday. I was in the living room alone and my parents were in the kitchen preparing the dinner. I remember that the table was set and that my father was mashing the potatoes. I was looking out of a large bay window when I saw a whirl of dust coming. Suddenly it grew dark. The wind was tearing down wires and poles, and moving houses off their foundations. Just then my father came into the room and caught me, but as we were about to leave the room something came flying through the window, breaking it and knocking plaster from the opposite wall. We also were knocked to the floor. Finally we got out of the house through a window and ran to the neighbors for help as our house was on fire.

The emotion of joy. As we have observed above, joy ranks second in frequency. In a total of 65 memories, or 27.9 per cent of those studied, joy was reported as being the outstanding emotion experienced. Seven different situations were found as having given rise to this emotion, the first one of which was the receiving of gifts. Twelve boys and eleven girls remembered such incidents. The things received were, food, candy, toys, clothing, pets and other such things which children enjoy. Several typical memories are given below.

Z. O., female, 3:11. The experience which I remember occurred at the time I had the measles. None of the pain or inconvenience of the illness do I remember. The only impression I have is a vivid picture of the day the doctor came, probably during my recovery, to examine his patient. I know the doctor was a kindly old-fashioned practitioner but I do not have a picture of his actual appearance. The fact I do remember is that he presented me with a stick of chewing gum, and chewing gum in those days was a treat. In fact, such a treat was it that years later I still referred to that doctor as the one who had given me a stick of gum when I was ill with the measles.

S. D., male, 3:2. One day I sat on the back steps eating frosting out of a pan. Our cook had been very generous and had

left a great deal of frosting in the dish. I remember very distinctly the great pleasure which I got out of it. It was a white boiled frosting and I had more of it on my face and hands than I got into my mouth.

This third memory is inserted here because of the fact that it was the earliest one reported. The age given, which was carefully checked, is one year. The memory is that of G. D. a girl.

I remember my first birthday, and the one gift I remember receiving was a box of wax ducks. I can remember exactly how they looked, and that they were in a gray pasteboard box. I also know that I was sitting at the dining room table (in a high chair, I suppose) when I received the gift. I can still see my mother showing me the box of ducks as I sat there.

Nearly as many students reported memories of incidents in which they enjoyed receiving attention from others as reported memories of receiving gifts. A number of memories were of birthday parties and other group functions in which the child actively participated or was exhibited for some reason before a group of people. Several such memories follow.

V. H., male, 4:2. On my fourth birthday my mother gave me a pocket watch, and although I could not tell the time, I was very proud of the gift. Soon after, my mother and I made a trip, by train, to Chicago. I was playing with and admiring my watch when the conductor came through the car. "What time have you, son?" asked he. I looked at my watch carefully and replied "Ten minutes to two, what time have you?" (This was a guess.) He smiled and looked at his watch and admitted that I was right to the minute.

A. C., female, 2:11. My mother took my older sister and me to school so that my sister could be enrolled in the kindergarten. I can remember entertaining the class by standing on a chair and showing off my pretty lace dress and white shoes. The teacher even asked to see my lace slip, and since I was proud of it, I showed it to her and the kindergarten class.

J. G., female, 2:7. My grandmother died and was buried from the church. When people patted me on the head before the service and while I was going down the aisle, I thought it was because of the new coat and hat I had on. But I was the most proud when the priest read off the names of the relatives of the deceased. Although I only remember hearing my mother's and father's name beside mine, I was exceedingly proud and felt that we almost owned the church.

Thirteen students recalled experiences with novel situations which gave rise to joy. Ten of these memories were reported by girls and 3 by boys. A memory which is typical of this group is that of G. P. who recalled a wedding she attended when she was 4:0.

My parents and I attended my cousin's formal wedding which was solemnized in a large church in Chicago. I distinctly remember sitting on my father's lap, next to the aisle, and very near the altar. I remember the procession but especially the ring-bearer to whom my father called my attention. The train on my cousin's dress and the roses she carried are also distinct in my memory. So greatly was I impressed with the wedding, that for a long time after I continued to talk about it.

The last four situations which gave rise to joy were not mentioned in many memories. These are: joy due to new friendship formed, mere contentment, tricks played on adults, and birth of younger brother. Only one memory will be included here. G. D. was a little girl aged 3:9 when her brother was born.

My brother was born when I was 3:9. I can remember asking if I could sleep with my mother, the night before my brother was born, and that our maid said that I couldn't and that I must sleep in my own room. The next morning when the maid awoke me, she said that she had a surprise for me. She brought me down stairs with her and there in a basket I found my baby brother. I was awfully excited and I wouldn't eat any breakfast until I ran around and told all the neighbors. Since it was May, I didn't want to wear a coat. The maid, however, insisted that since it was early in the morning and chilly, that I wear my black and white checked coat, but I could hardly wait until I buttoned it and ran out to announce that I had a baby brother.

The emotion of anger. Anger was reported as the emotion experienced in twenty-four of the memories. It is interesting to note that a larger per cent of girls reported anger than boys. In each case we find that the anger resulted from being thwarted, injured or being forced to do something which was counter to the inclinations of the child at that time. The anger was directed at adults, children and inanimate objects. Most of the children, and especially the girls, were angry at adults; 13 of the 24 memories were of this type. Two typical memories are reported here.

V. H. I., male, 4:0. My first spell of anger, which I can remember, was when I was four years old, on my fourth birthday. My aunt sang a great deal and had taught me many quite long songs. This day my father wanted me to sing for him, but I refused because I had been ill and could hardly speak. He grew quite angry when I refused, but I didn't think anything of it. In about five minutes he asked me again and I refused so he sent me to bed. That was even before sunset and I really remember having called my father a fool. I was so angry I couldn't cry.

V. L., female, 4:0. My sister had taken me down town to buy a sucker for me. When I came home my mother was sitting in a chair very near the door. As I walked into the house Mother asked what kind of a sucker I had, and I told her "butterscotch." Then she asked me if she could taste of it. I told her to only lick on it, for I wanted to keep the sucker whole as long as I could, and not break it in any way. Mother took a bite from the sucker and I slapped her face. This, of course, hurt Mother's feelings, so she made me sit in a dark closet to finish the sucker. I can remember that while I was sitting in this dark closet and biting the sucker all to pieces, so that I could soon get out of the closet, I wished Mother all sorts of bad luck. I didn't care what happened to her. There was a dish which she treasured very much which I planned to smash on the floor. Mother was in the kitchen when I finished eating my sucker, so I tip toed to the kitchen and threw the stick of the sucker at her telling her that now she could bite off from it. I don't remember why, but the dish I planned to break was never broken. This has been told to me very often, but the part I remember most vividly is how angry I was while sitting in the dark closet biting the sucker to pieces.

In 8 of the memories, anger was directed at other children. The memory of D. A. a girl, 3:1 is representative.

I can remember how angry I was when my little cousin, who was at our house, dropped my doll and broke it. I cried and kicked and made so much confusion that my mother and aunt promised to buy me another.

In only three cases was the anger directed at objects.

K. T., female, 2:10. I remember this experience because it made me very angry at the time. My aunt had given me a new doll and warned me not to take it to the barn for I would be liable to drop it. I took it to the barn, however, and as I was trying to make it walk up the concrete steps I dropped it, and it broke. It made me so

angry, I can remember vividly that I kicked and screamed and would not be quieted until I was told that I could have another one just like it.

Wonder and Curiosity. In 19 of the memories, wonder and curiosity was the predominating emotion. There are 3 general situations under which the memories have been classified: (1) wonder and curiosity due to novel situations, (2) due to experiences with death, and (3) wonder which led to experimentation. Typical memories are cited below.

L. U., female 4:0. My youngest sister is four years younger than I. I distinctly remember the night of her birth. The maid had put me to bed and climbed in with me to keep me quiet. I knew something was going on because of the closed doors, the presence of my grandparents, and the many lights which were lit. The commotion had been going on for some time when I distinctly remember hearing the front door slam and a car drive away. I wondered what it was all about.

F. S., female, 3:1. When I was very young, I was particularly fond of an older girl who lived next door to us. Every morning, when she left for work, I ran out to meet her and to talk with her. I derived much pleasure from this daily contact with her because she always seemed to be so interested in me. One day she was taken ill suddenly and died. Since I missed her the following morning and had inquired, my mother told me that she had gone to heaven to be with the angels. On the second morning I waited for her again and when she did not appear, I walked into the neighbor's house, without being seen, climbed up to the casket and looked it all over. I patted my friend's hands and face, kissed her and talked to her. I was puzzled and thought that she must be awfully cold. Why didn't they cover her up? I also wondered why she wore such a nice dress to go to heaven, and why she didn't talk to me.

Q. N., female, 2:8. I was nearly three years old as it was the winter that my parents left for a southern trip and left me with my grandparents. Grandmother, not in favor of dressing me in the light-colored frocks which my mother favored, supplied me with several calico frocks. I still have the dress in question. The house next door was being painted a yellow color and for several days I had desired to see the effect of the paint on my dress. Finally, one day I did lean against a freshly painted section and ruined the dress, smeared my hands and got my hair sticky. The emotion was curiosity, although my grandmother insisted that it was my hatred of calico dresses.

Sorrow and disappointment. Although the number of memories of sorrowful and disappointing experiences is not great, over half of those reported dealt with the individual's sorrow for himself. Evidently very young children are less sorry for animals and still less sorry for other human beings than for themselves; they are still quite largely egocentric.

D. T., male, 3:11. One day I left my coaster wagon, which my father had made for me, in front of the doors of the garage. As Father backed out with the car, he ran over my wagon and broke it. When I saw what had happened, I began to cry for I thought that my wagon was broken beyond repair.

Z. T., female, 3:2. Mother had gotten some red and white striped peppermint candy and I saw her hide it. I awaited my chance but she caught me in the act of helping myself. I remember the incident because I had to watch the other children eating the candy while I went without any. I had a keen feeling of disappointment.

L. C., female, 4:2. An anti-German parade was passing our home. In the parade, at the very end, was a goat labelled "Germany." He was being led, of course, and

behind him was an American soldier kicking the goat every step or two. The meaning of the thing did not bear upon me as did the cruelty to the goat. I was fond of animals and it was sometime before my sorrow for the goat could be dispelled by Mother's explanations. I cried and kept repeating "That poor little goat."

V. H. I., male, 4:4. At the time my sister was born, I was given a puppy. I used to put the pup in her perambulator and would laugh at her sucking the little tail. At Christmas time Dad had built a barrel house for Peep (the pup) outside. On Christmas I retired early in the hope of catching Santa Claus and forgot to tie Peep to his chain. During the night Peep left his barrel and froze his tail. When Dad brought him in the next morning his tail was all covered with ice and dirt. I laughed at the sight, but when Dad told me that his tail would come off because it had been frozen, I burst out crying and sleds, etc. under the Christmas tree held no interest.

Pain. In 12 memories pain was reported. In the case of the boys, the pain was due to breaking a leg, cutting foot on a piece of glass, breaking three ribs, tooth ache, minor operation and a severe spanking. Three of the girls experienced pain as a result of being hit on the head, one was in an automobile accident, and another was bitten by a dog.

Z. P., male, 2:11. When I was 2:11, I fell down three steps at the church and broke my leg. I distinctly remember my screaming and my brothers' scared faces as they ran to tell Dad. Then Father came out and picked me up. I can distinctly remember the great pain which I experienced.

Q. S., female, 4:3. I was playing with a group of children most of them a bit older than I. I had just given up my swing and was pushing some of the others. Without looking, I left the first swing to cross over to the end one. In doing so, I walked too close to a high swinging swing and the corner of it hit my head. I don't distinctly remember whether I was knocked to the ground or not, but I do remember that I tried very hard not to cry, but the tears persisted in coming. Since the school ground was only three blocks from my home, I ran all the way home, but there I found no one home and both doors were locked. I ran to a neighbor who washed my wound, applied something and bandaged my head.

Shame and guilt. Memories of being ashamed or having a guilty feeling were very few in number. Only 4 girls and 2 boys reported such memories. Two memories which are representative of this group are given here.

R. T., male, 2:2. When the following experience took place I was still wearing dresses. One day I was playing at the rear of our barn, and I decided to make a little fire and burn some papers. I went into the house and got a box of matches, dumped them into my dress and folded it up as a bag in front of me so that I could carry the matches and also escape detection. When my mother saw me leaving the house, she asked me what I was going to do. All that I would say was, "Don't ask me." I said this because I had a guilty feeling. After my mother asked the same question several times and each time received the same answer, she decided to investigate and thus found the matches.

D. N., female, 4:7. Mother, sister and I were having our picture taken for Christmas. I had a very pretty white embroidered dress that was much too short for me to wear. Mother insisted that I wear it because the top was pretty, but I did not want to because my underskirt would show on the picture. The photographer insisted that it would not, but I was sure that it would and sobbed and sobbed. Finally, I let them take the picture but I was very worried. Imagine my surprise when we got the proofs and my underskirt did not show.

Miscellaneous emotions and experiences with no emotion reported. There are a few scattered emotions which have not been included in those discussed above. Four boys reported memories with the following emotions: surprise, feeling of strangeness, stubbornness and disgust. For the girls we find that 2 reported surprise, 2 annoyance and 1 dismay. None of the incidents in this particular group is very striking.

The reports on 12 memories did not include a statement of a particular emotion experienced. The students felt that although the memories were quite vivid and clear that they could not state whether or not they experienced an emotion at the time of the incident. This obviously does not mean that no emotion was experienced, but merely that the emotion did not make a great impression if one was experienced. It is rather significant that more such memories were not reported.

CONCLUSION

1. Although the coefficient of correlation for intelligence and age at the time when the experience was had is practically zero, there does seem to be a tendency for those individuals in the upper quartile of intelligence to report earlier memories than those reported by individuals less favored intellectually.

2. The majority of childhood memories date back to the third and fourth years of life. The mean age for the whole group is 3:7; for men, it is 3:8, and for women, it is 3:6.

3. Fear, joy and anger, the three emotions, which according to John B. Watson are prominent in young children, appear the most frequently in childhood memories. Fear and joy include 58.3 per cent of the memories studied. Other emotions which were reported, arranged in the order of decreasing frequency, are: wonder and curiosity, sorrow and disappointment, pain, shame and guilt.

4. One-third of the women reported memories of joyful experiences and thus placed joy at the head of their list. A much larger percentage of men than women remembered fearful experiences; but, on the other hand, a larger percentage of women remembered experiences which angered them. No sex differences are evident for the emotions, wonder and curiosity, sorrow and disappointment and pain. Shame and guilt appeared about three times as often in memories reported by women as those reported by men.

Brief Report

A Psychological Laboratory for Child Study in China

AMONG the most recently established psychological laboratories of China, not yet reported (1) are those of Fu Jen (Catholic) University at Peiping. In this university the department of psychology with the department of pedagogy constitutes the college of education. These distinct departments were simultaneously opened with ten others at the creation and registration of Fu Jen University by mandate of the National Ministry of Education at Nanking on August 2, 1929.

Lectures in psychology were begun in October 1929. The customary general psychology laboratory and a small animal laboratory were opened a year later. In October 1931 our first Child Study Laboratory was opened in a small adjoining house with an attendance of twelve children and six students of psychology under the direction of the writer (2).

At the present writing the department has a suite of 5 rooms divided as follows; general laboratory, reference library, offices, cageroom and animal laboratory, in the main building. Nearby the second Child Study Laboratory has a spacious ensemble of six rooms and playground. The departmental personnel consists of four professors all holding degrees from American universities and eighteen majoring students.

The only distinctive feature of this department is its Child Study Laboratory, which is believed to be the first and only one in China, which was originally erected and completely controlled by a department of psychology without school system connections.

This Child Study Laboratory was planned primarily for the convenience of observing and testing preschool children under laboratory conditions. Nevertheless kindergarten learning projects are provided there for the current development of the children, and the group of buildings is publicly called a kindergarten (yu chih yuan) for sentimental reasons. The regularly attending boys and girls range from three to seven years and number 16. Their learning projects are conducted by a trained kindergarten teacher.

The child study work performed by the psychology students is catalogued as a Laboratory Course in Child Psychology and merits 2 academic credits for six clock hours of study. Prerequisite to this course are courses in general psychology, elementary experiments and lectures on child study. The course is limited to ten selected students. Their research project is

to find mental measurements of the children comparative to those of Baldwin and Stecher, whose "Psychology of the Preschool Child" is the laboratory manual.

The kindergarten area is 104 by 128 feet. The playground is in the north part, the buildings in the south, and all is surrounded by a high brick wall as is customary in Peiping. There are 2 large playrooms, the larger serves for the customary kindergarten projects, while the smaller is reserved for large-muscle activities when the children can not use the playground because of the wind or Peking dust-storms. On the east of the larger playroom is an adjoining structure containing 2 simple test-rooms. Three more test-rooms and the laboratory apparatus are housed in the building between the 2 courts. In the southeast corner is the waiting room for the convenience of the children's personal servants. On the playground are slideboard, ladders, swings, trees and two resting platforms not shown on the plan.

The waiting room is an interesting local feature of Peiping kindergartens. The personal servants of the Peiping children are very much attached to their young charges, and it is therefore necessary to provide conveniences for them while they wait nearby. As the affections of the children toward their men or women servants is of equal if not greater intensity, it is necessary to permit the younger children to see their servants in the waitingroom or courtyard during the recess periods. This gradual emancipation has been found to be the only feasible one for Peiping preschool children, when entering the kindergartens.

GREGORY SCHRAMM.

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